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ABSTRACT

Far-ultraviolet photometry for 741 objects in a field in Sagittarius centered near M8 and 541 objects in a field centered near ζ Scorpii is presented. These data were extracted from electrographic images obtained with two cameras during a shuttle flight in 1991 April/May. The cameras provided band passes with λ_{eff} = 1375 Å and λ_{eff} = 1781 Å. Synthetic colors show that these bands are sensitive to effective temperature for hot stars. Our measurements were placed on a quantitative far-ultraviolet magnitude scale by convolving the spectra of stars observed by *IUE* with our cameras' spectral response functions. Fifty-eight percent of the ultraviolet objects were identified with visible stars using the SIMBAD database while another 40% of the objects are blends of early type stars too close together to separate with our resolution. Our photometry is compared with that from the *TD-1, OAO 2,* and *ANS* satellites and the S201 (Apollo 16) far-ultraviolet camera and found to agree at the level of a few tenths of a magnitude. Unlike previous studies, almost half of the identified visual counterparts to the ultraviolet objects are early B stars. A plot of distance modulus against ultraviolet color excess reveals a significant population of stars with strong ultraviolet excesses.

Subject headings: stars: early-type — surveys — techniques: photometric — ultraviolet: stars

1. INTRODUCTION

Previous papers have reported ultraviolet stellar photometry obtained with electrographic cameras operated on the lunar surface by Apollo 16 astronauts (Experiment S201; Page, Carruthers, & Heckathorn 1982; Carruthers & Page, 1983, 1984a,b,c) or carried aboard sounding rockets (Schmidt & Carruthers 1993a, hereafter Paper I), and 1993b, hereafter Paper II).

Two NRL Far-Ultraviolet Cameras were operated in Earth orbit during Space Shuttle Mission STS-39 from 1991 April 28 to May 6. Images were obtained of 12 star fields. This paper presents stellar photometry for two of those fields, one centered in Sagittarius and one centered in Scorpius. The Sagittarius field overlaps one observed with a very similar camera during the Apollo 16 mission (Page et al. 1982; Carruthers & Page 1984b).

2. THE INSTRUMENTATION

The camera fields were circular with a diameter slightly less than 20°. For the observations reported here, Camera 1 was used with a CaF_2 filter. This provided sensitivity between 1220 and 1620 Å and an effective wavelength for flat photon flux of 1375 Å. Camera 2 with a SiO_2 filter was sensitive between 1610 and 2000 Å with effective wavelength of 1781 Å. Further details regarding the cameras can be found in papers by Carruthers (1986) and Carruthers et al. (1992). Details of the camera calibrations, including pre-flight and post-flight measurements are given by Carruthers et al. (1994) and Christensen et al. (1994).

To explore the properties of the far ultraviolet cameras' photometric system, magnitudes were calculated using fluxes from the new Kurucz model atmospheres (described by Kurucz 1993 and distributed on Kurucz CD-ROM No. 13) and the preflight response functions from Carruthers (1986). All the models were constructed with a microturbulent velocity of 2.0 km s^{-1}. We have only used models with solar composition but have included all gravities and all temperatures above 6000 K.

We combined the calculated ultraviolet magnitudes with Kurucz's tabulated V-magnitudes to form the colors ($m_{1375} - m_{1781}$) and ($m_{1781} - V$). In doing this we set the zero point so that m_{uv} = 10.0 and V = 10.0 correspond to a flux of F_λ = 3.6 × 10^{-13} ergs cm^{-2} s^{-1} $Å^{-1}$. This is equivalent to $m_\lambda = -2.5 \log F_\lambda - 21.1$.

The calculated colors are listed in Tables 1 and 2 and are plotted in Figure 1. Both colors show significant gravity dependence. The ($m_{1781} - V$) index retains its temperature sensitivity throughout the entire range but ($m_{1375} - m_{1781}$) is insensitive to temperature above about 20,000 K and below about 6750 K.

3. THE OBSERVATIONS AND ANALYSIS

Table 3 lists the images used in this paper. One field was centered near M8 in Sagittarius while the other was centered near ζ Sco. The wide range of exposure times provides for a large dynamic range. In Figure 2 (Plates 14–17) we present prints from both fields taken with both cameras.

Following the same procedures as described in Paper I the images were digitized with the NRL PDS microdensitometer,

TABLE 1
CALCULATED ($m_{1375} - m_{1781}$)

T_{eff}/log g	0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00
6000	6.65	6.77	6.85	6.94	7.00	7.04	7.05	7.04	6.99	6.91
6250	6.34	6.51	6.66	6.75	6.84	6.90	6.93	6.93	6.89	6.82
6500	6.24	6.42	6.61	6.77	6.76	6.84	6.89	6.90	6.88	6.83
6750	6.21	6.37	6.54	6.70	6.84	6.71	6.79	6.85	6.89	6.89
7000	6.17	6.28	6.43	6.56	6.66	6.75	6.54	6.60	6.65	6.67
7250	5.83	6.01	6.16	6.29	6.38	6.45	6.52	6.27	6.34	6.39
7500	4.71	5.19	5.41	5.60	5.78	5.93	6.06	6.16	5.93	6.02
7750	...	4.07	4.43	4.66	4.88	5.12	5.37	5.58	5.72	5.57
8000	...	2.71	3.29	3.67	3.97	4.25	4.54	4.86	5.12	5.06
8250	...	1.72	2.17	2.53	2.89	3.27	3.64	4.03	4.44	4.73
8500	...	...	1.43	1.65	1.90	2.23	2.62	3.05	3.55	4.05
8750	...	...	1.01	1.10	1.24	1.44	1.74	2.12	2.58	3.17
9000	...	...	0.77	0.77	0.82	0.94	1.13	1.41	1.79	2.26
9250	...	...	...	0.57	0.57	0.62	0.74	0.93	1.21	1.59
9500	...	...	...	0.44	0.40	0.41	0.48	0.61	0.81	1.10
9750	...	...	...	0.35	0.29	0.27	0.30	0.38	0.53	0.75
10000	...	...	...	0.28	0.21	0.18	0.18	0.23	0.33	0.50
10500	...	...	...	0.17	0.10	0.05	0.03	0.04	0.09	0.18
11000	...	...	...	...	0.02	−0.03	−0.06	−0.06	−0.05	0.00
11500	...	...	...	...	−0.05	−0.10	−0.13	−0.14	−0.13	−0.11
12000	...	...	...	...	−0.10	−0.15	−0.18	−0.20	−0.20	−0.18
12500	...	...	...	...	−0.15	−0.20	−0.23	−0.25	−0.25	−0.24
13000	...	...	...	...	−0.19	−0.24	−0.27	−0.29	−0.29	−0.29
14000	...	...	...	−0.17	−0.26	−0.31	−0.35	−0.37	−0.37	−0.37
15000	...	...	...	...	−0.31	−0.37	−0.41	−0.43	−0.44	−0.44
16000	...	...	...	...	−0.35	−0.42	−0.46	−0.48	−0.49	−0.49
17000	...	...	...	...	−0.38	−0.46	−0.50	−0.53	−0.54	−0.55
18000	...	...	...	...	−0.41	−0.49	−0.54	−0.57	−0.58	−0.59
19000	...	...	...	...	−0.43	−0.52	−0.57	−0.61	−0.62	−0.63
20000	...	...	...	...	...	−0.54	−0.60	−0.63	−0.66	−0.67
21000	...	...	...	...	...	−0.56	−0.62	−0.66	−0.69	−0.70
22000	...	...	...	...	...	−0.57	−0.64	−0.69	−0.71	−0.73
23000	...	...	...	...	...	−0.58	−0.66	−0.71	−0.74	−0.75
24000	...	...	...	...	...	−0.59	−0.67	−0.73	−0.76	−0.78
25000	...	...	...	...	...	−0.59	−0.68	−0.74	−0.77	−0.80
26000	...	...	...	...	...	−0.58	−0.68	−0.75	−0.79	−0.81
27000	...	...	...	...	...	...	−0.68	−0.75	−0.80	−0.83
28000	...	...	...	...	...	...	−0.68	−0.76	−0.81	−0.84
29000	...	...	...	...	...	...	−0.67	−0.75	−0.81	−0.84
30000	...	...	...	...	...	...	−0.66	−0.75	−0.81	−0.84
31000	...	...	...	...	...	...	−0.66	−0.74	−0.80	−0.84
32000	...	...	...	...	...	...	...	−0.73	−0.80	−0.84
33000	...	...	...	...	...	...	...	−0.73	−0.79	−0.83
34000	...	...	...	...	...	...	...	−0.73	−0.78	−0.83
35000	...	...	...	...	...	...	...	−0.72	−0.78	−0.82
37500	...	...	...	...	...	...	...	...	−0.78	−0.82
40000	...	...	...	...	...	...	...	...	−0.78	−0.82
42500	...	...	...	...	...	...	...	...	...	−0.82
45000	...	...	...	...	...	...	...	...	...	−0.82
47500	...	...	...	...	...	...	...	...	...	−0.82
50000	...	...	...	...	...	...	...	...	...	−0.83

stars were found using the Stetson (1987) method (and verified visually) and instrumental magnitudes were extracted by aperture photometry using IRAF. In the M8 field 741 objects were found while the ζ Sco field yielded 541 objects. These objects are listed in Tables 4 and 5. Tables 4 and 5 will also be made available in machine-readable form in the AAS CD-ROM series, Vol. 4.

Fifty-six stars in the ζ Sco field and 84 stars in the M8 field were identified in the SAO catalog and a polynomial fit was made between the image coordinates and the celestial coordinates. The rms scatter in these fits were between 1.′0 and 1.′3. This can be taken to be the accuracy of our coordinates which are listed for the individual stars in the second and third columns of Tables 4 and 5.

The FWHM of the star images was 5.′0 for Camera 1 and 6.′4 for Camera 2. Unlike the images analyzed in Papers I and II, the FWHM was reasonably constant from the field center to the edge. Thus, the correction for location in the field which was applied previously was unnecessary (that is to say, a in eq. [2] (2) of Paper I is zero). This resulted in a better determination of the saturation corrections.

For each star we formed a weighted mean magnitude from

TABLE 2

CALCULATED ($m_{1781} - V$)

T_{eff}/log g	0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00
6000	8.01	7.87	7.48	7.38	7.31	7.29	7.28	7.29	7.30	7.29
6250	6.97	6.78	6.57	6.17	6.04	5.98	5.96	5.97	6.01	6.06
6500	5.93	5.72	5.47	5.23	4.93	4.81	4.75	4.74	4.77	4.83
6750	4.96	4.78	4.53	4.27	4.04	3.87	3.75	3.68	3.66	3.67
7000	4.06	3.96	3.73	3.50	3.29	3.11	3.05	2.96	2.91	2.91
7250	3.19	3.21	3.05	2.85	2.66	2.52	2.39	2.39	2.34	2.31
7500	2.31	2.51	2.44	2.29	2.12	2.00	1.91	1.83	1.87	1.84
7750	...	1.87	1.88	1.79	1.67	1.54	1.48	1.42	1.38	1.44
8000	...	1.30	1.39	1.35	1.26	1.16	1.07	1.05	1.03	1.10
8250	...	0.83	0.96	0.95	0.90	0.82	0.74	0.69	0.70	0.70
8500	...	...	0.62	0.62	0.58	0.52	0.46	0.39	0.37	0.41
8750	...	...	0.33	0.35	0.32	0.27	0.21	0.15	0.09	0.13
9000	...	...	0.09	0.11	0.09	0.05	0.00	−0.06	−0.12	−0.17
9250	...	...	...	−0.09	−0.11	−0.15	−0.19	−0.24	−0.29	−0.35
9500	...	...	...	−0.27	−0.29	−0.32	−0.37	−0.41	−0.46	−0.51
9750	...	...	...	−0.43	−0.45	−0.48	−0.52	−0.56	−0.61	−0.65
10000	...	...	...	−0.58	−0.59	−0.63	−0.66	−0.70	−0.74	−0.79
10500	...	...	...	−0.84	−0.85	−0.88	−0.91	−0.95	−0.98	−1.02
11000	...	...	...	...	−1.07	−1.10	−1.13	−1.16	−1.19	−1.23
11500	...	...	...	...	−1.27	−1.29	−1.32	−1.35	−1.38	−1.41
12000	...	...	...	...	−1.45	−1.47	−1.49	−1.52	−1.55	−1.58
12500	...	...	...	...	−1.62	−1.63	−1.64	−1.67	−1.70	−1.73
13000	...	...	...	...	−1.77	−1.77	−1.79	−1.81	−1.83	−1.86
14000	...	...	...	−2.03	−2.03	−2.03	−2.04	−2.06	−2.08	−2.10
15000	...	...	...	...	−2.24	−2.25	−2.26	−2.27	−2.29	−2.31
16000	...	...	...	...	−2.43	−2.44	−2.45	−2.46	−2.48	−2.50
17000	...	...	...	...	−2.59	−2.60	−2.61	−2.63	−2.64	−2.66
18000	...	...	...	...	−2.73	−2.75	−2.76	−2.77	−2.79	−2.81
19000	...	...	...	...	−2.86	−2.88	−2.89	−2.90	−2.92	−2.94
20000	...	...	...	...	...	−2.99	−3.01	−3.02	−3.04	−3.06
21000	...	...	...	...	...	−3.10	−3.12	−3.13	−3.15	−3.17
22000	...	...	...	...	...	−3.21	−3.22	−3.23	−3.25	−3.27
23000	...	...	...	...	...	−3.31	−3.31	−3.33	−3.35	−3.37
24000	...	...	...	...	...	−3.40	−3.41	−3.42	−3.43	−3.45
25000	...	...	...	...	...	−3.48	−3.49	−3.50	−3.52	−3.53
26000	...	...	...	...	...	−3.56	−3.58	−3.59	−3.60	−3.61
27000	...	...	...	...	...	...	−3.65	−3.66	−3.67	−3.69
28000	...	...	...	...	...	...	−3.72	−3.74	−3.75	−3.76
29000	...	...	...	...	...	...	−3.77	−3.80	−3.82	−3.83
30000	...	...	...	...	...	...	−3.81	−3.86	−3.88	−3.89
31000	...	...	...	...	...	...	−3.84	−3.90	−3.93	−3.95
32000	...	...	...	...	...	...	...	−3.94	−3.97	−4.00
33000	...	...	...	...	...	...	...	−3.96	−4.01	−4.04
34000	...	...	...	...	...	...	...	−3.99	−4.04	−4.07
35000	...	...	...	...	...	...	...	−4.01	−4.06	−4.10
37500	...	...	...	...	...	...	...	...	−4.11	−4.14
40000	...	...	...	...	...	...	...	...	−4.16	−4.19
42500	...	...	...	...	...	...	...	...	...	−4.23
45000	...	...	...	...	...	...	...	...	...	−4.28
47500	...	...	...	...	...	...	...	...	...	−4.31
50000	...	...	...	...	...	...	...	...	...	−4.34

all the images on which it was measured. Although magnitudes from images which are saturated at the center are corrected as described in Paper I, the correction introduces uncertainty. Hence, progressively lower weight was given to images with greater saturation; only the magnitudes of a few of the brightest stars will be sensitive to the saturation correction. Similarly, lower weights were given to star images which were poorly exposed. Again, only the faintest stars will have magnitudes which depend on weak images.

We identified a number of stars for which *IUE* spectra are available. After eliminating those where blending was suspected (based largely on identifications from SIMBAD as discussed below) the spectra were convolved with the preflight sensitivity functions (Carruthers 1986) to obtain the ultraviolet magnitudes. The zero point corrections to place our magnitudes on the standard system (as defined above with $m_{uv} = 10.0$ at a flux of $F_\lambda = 3.6 \times 10^{-13}$ ergs cm^{-2} s^{-1} Å^{-1}) were then determined. Although the actual sensitivities of the cameras as a function of wavelength are still being determined (Carruthers et al. 1994), only the *shape* of the response curves (not their

TABLE 3

LOG OF OBSERVATIONS

Field	Date	Time	α_{1950}	δ_{1950}	Camera	Exposure
M8	1991 May 5	6:40	18^h01^m	−24°35′	1	3, 10, 30, 100, 300
					2	3, 10, 30, 100
ζ Sco	1991 May 4	23:45	16^h56^m	−41°10′	1	3, 10, 30, 30, 100
					2	3, 10, 30, 30

absolute values) are significant since the *IUE* absolute spectrophotometry is used to calibrate our observations. The results are only weakly dependent on slight deviations of the *relative* sensitivity versus wavelength curves from the preflight measurements. For the magnitudes from Camera 1 (m_{1375}, 20 stars), the rms scatter was 0.22 magnitudes and thus the zero point has a standard error of 0.05 magnitudes. For Camera 2 (m_{1781}, 16 stars), the rms scatter was 0.26 magnitudes and the standard error of the mean was 0.06 magnitudes. The ultraviolet magnitudes corrected with these zero points are listed in the fourth and fifth columns of Tables 4 and 5.

The use of *IUE* fluxes to calibrate our magnitudes is subject to some uncertainty due to the degredation of the *IUE* cameras. An examination of the dates of the *IUE* spectra indicates that the degredation is unlikely to affect our zero points at a level any greater than the standard errors cited above. When all of the far-ultraviolet camera images have been analyzed and the *IUE* final archive is complete, we intend to rediscuss the ultraviolet magnitude calibration.

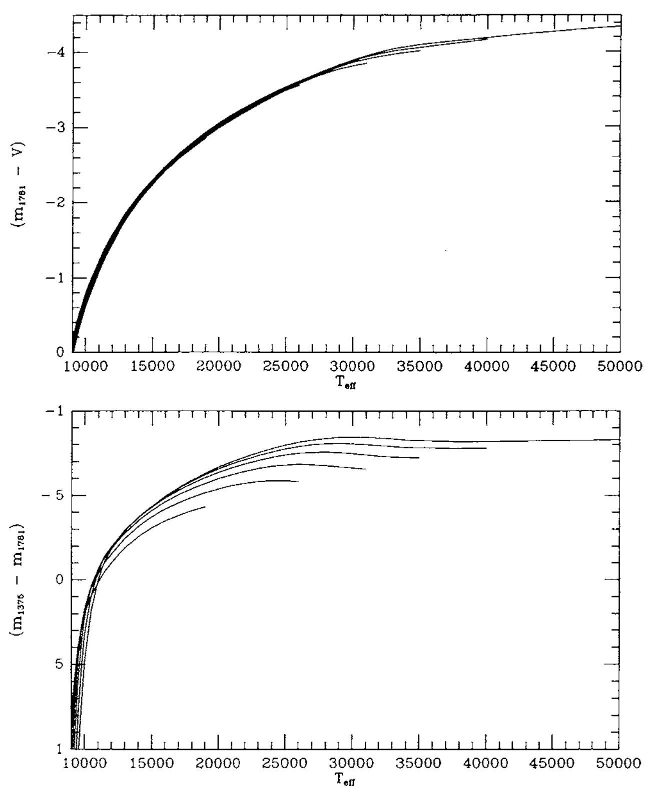

FIG. 1.—Calculated ultraviolet colors for Kurucz models. The various curves represent log g= 2.5, 3.0, 3.5, 4.0, 4.5, and 5.0 from the lowest to the uppermost.

The scatter in the comparison of our instrumental magnitudes with those from *IUE* spectra is a combination of measurement errors for individual stars, sensitivity variations across the camera fields and uncertainties in the *IUE* fluxes. Assuming the latter is about 10% (T. Teays 1994, private communication), we can attribute total errors of 0.22 magnitudes to our photometry for stars in the brightness range of the *IUE* calibration stars, $3.5 < m_{uv} < 8$.

We interrogated the SIMBAD database for stars near the ultraviolet objects. As in previous papers, we have given the information for stars which are possibly associated with the ultraviolet objects in the fifth, sixth, and seventh columns of Tables 4 and 5. When there is more than one star which can plausibly contribute to the ultraviolet flux the identification is given as "Blend," a composite V or P magnitude is given and the spectral types of all the stars are listed in order of optical brightness. For objects associated with a star cluster, the spectral type refers to the dominant star in the group if there is one.

In the present fields 58% of the ultraviolet objects are identified with visible stars. Forty percent are blends while 22 objects are identified with star clusters or parts of star clusters. Only eight objects were not identified with any known object from the SIMBAD database.

4. COMPARISON WITH OTHER PHOTOMETRY

The *TD-1* (Thompson et al. 1978), *OAO 2* (Code, Holm, & Bottemiller 1980), *ANS* (Wesseluis et al. 1982) and S201 (Page et al. 1982) catalogs were searched for stars in common with Tables 4 and 5. Only stars with unique visible identifications were included.

In Figure 3 we compare m_{1781} with the magnitudes from the previous studies which matched it most closely in effective wavelength. It can be seen that both the *ANS* and the *TD-1* magnitudes are systematically fainter than ours. The differences are 0.05 mag. and 0.29 mag. for m_{1565} and m_{1965} from *TD-1* with rms scatter about these values of 0.56 mag. The *ANS* 18 and 15 W magnitudes are 0.02 and 0.11 mag fainter than ours on average with rms scatter of 0.73 and 0.53 mag. On the other hand, except for several of the brightest stars, the *OAO 2* m_{1919} magnitudes tend to be fainter than m_{1781}, while the m_{1550} magnitudes are brighter. The mean differences for both are 0.28 and 0.42 mag with scatter of 0.23 and 0.29 mag.

Aside from these offsets, the stars closely parallel the solid lines for stars with m_{1781} in the range from about four to eight. Fainter than this the *TD-1* magnitudes tend to be somewhat

TABLE 4

ULTRAVIOLET OJECTS IN THE M8 FIELD

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	Spectral Type
1	7:18:55	-24:45	...	4.30	HD 156932	10.1	B9.5III
2	7:18:59	-25:00	0.38	...	HD 157056	3.27	B2IV
3	7:20:14	-22:58	6.66	...	HD 157282	7.40	B8/B9V
4	7:20:17	-22:46	...	6.56	...	...	...
5	7:21:54	-24:28	...	6.72	CPD-24 5891	8.50	B9
6	7:22:53	-27:32	6.76	6.69	HD 157736	7.50	B9/B9.5V
7	7:23:15	-24:02	...	6.27	HD 157792	4.17	A3m
8	7:23:43	-26:16	7.72	7.12	HD 157865	7.40	B8/B9III
9	7:23:57	-25:53	5.25	5.52	HD 157864	6.43	B9.5/A0V
10	7:24:00	-28:43	8.21	7.09	Blend	7.61	A0V,B8IV
12	7:24:20	-29:46	5.53	...	HD 157955	6.00	B9IV
13	7:24:33	-28:18	7.66	7.36	Blend	7.47	B8/B9III,A1IV/V,A3II
14	7:24:34	-20:04	...	8.32	...	...	...
15	7:25:45	-28:48	8.03	7.75	Blend	8.31	A9V,B6III
16	7:26:30	-28:36	6.85	7.10	HD 158304	9.02	B3III
17	7:27:14	-29:20	...	8.09	Blend	9.2P	B6/B7II,A3
18	7:27:54	-23:04	...	8.51	HD 158581	9.00	B7III
19	7:28:20	-30:14	6.20	6.36	HD 158618	7.98	B1Ib:n
20	7:28:22	-23:54	4.83	4.58	HD 158643	4.81	A0V
21	7:28:37	-26:14	4.46	4.56	HD 158704	6.06	B9II/III
22	7:28:39	-30:22	6.15	6.31	Blend	7.49	B6V,A6/A7IV
23	7:29:56	-29:35	...	7.40	HD 158902	7.21	B3II
24	7:30:45	-30:23	5.10	5.40	HD 159090	7.40	B0III
25	7:31:11	-30:16	6.82	5.71	HD 159213	9.29	B7IV
26	7:31:28	-31:13	...	8.53	HD 159192	8.78	A0IV
27	7:31:33	-18:36	...	8.52	Blend	9.03	B8II/III,B9III
28	7:32:21	-21:59	5.86	5.72	HD 159376	6.50	Ap
29	7:32:47	-31:32	...	8.41	Blend	9.3P	A2,B9II/III
30	7:33:26	-22:24	7.41	7.24	Blend	8.44	A0IV,B8IV
31	7:33:30	-28:58	7.95	7.86	HD 159571	9.11	B8V
32	7:34:01	-31:20	...	8.19	Blend	9.14	B5,A2
33	7:34:35	-28:35	...	7.84	Blend	8.82	B6III,A3
34	7:34:36	-28:24	7.43	7.53	HD 159782	7.98	B9III
35	7:34:54	-17:41	7.04	7.16	HD 159864	8.58	B1Ib
36	7:36:15	-29:56	5.34	5.76	HD 160109	7.47	B5IV
37	7:36:30	-18:18	7.10	7.38	HD 160186	9.05	B1/B2Ib/
38	7:36:48	-32:14	3.44	3.69	NGC 6405	5.39	B3 to A0
39	7:37:03	-32:47	5.93	...	Blend	7.50	B4V,A0V
40	7:37:13	-28:54	6.28	6.32	HD 160319	7.18	B3Vne
41	7:37:34	-27:51	8.45	7.99	Blend	7.38	B9V,A2/A3III
42	7:37:46	-23:48	7.75	7.58	HD 160430	7.91	B2II
43	7:38:14	-32:07	5.62	...	NGC 6405	6.53	B4 to A0
44	7:38:29	-18:01	...	8.19	Blend	8.50	B9V,A1/A2IV,B9III/IV
45	7:39:04	-17:49	7.61	7.61	HD 160641	9.87	O9.5Ia-B1Ia(p)
46	7:39:52	-29:56	7.63	7.88	Blend	8.14	B3II/III,B7B8IV
47	7:40:04	-27:49	8.20	...	HD 160839	6.41	A9V:
48	7:40:17	-32:15	7.32	6.85	Blend	7.85	B9V,A0V
49	7:40:22	-18:13	8.12	8.01	HD 160886	10.10	B3Vnne
50	7:40:22	-32:55	7.64	7.42	SAO 209190	8.20	B9III
51	7:40:51	-16:43	...	8.40	HD 160957	8.70	A0V
52	7:41:08	-27:26	7.79	7.77	HD 161004	8.75	B9IVe
53	7:41:14	-22:09	...	7.93	BD-22 4400	9.58	B3
54	7:41:19	-21:25	8.50	8.56	HD 161082	9.30	B6II
55	7:41:19	-33:16	8.07	7.75	Blend	9.25	B8/B9II,A7III/IV
56	7:41:36	-27:13	7.43	7.62	HD 161103	8.69	Be
57	7:41:56	-22:52	...	8.46	HD 161187	9.30	B8/B9II
58	7:42:10	-28:24	8.10	7.70	HD 316204	9.29	B2III
59	7:42:13	-27:25	8.11	...	Blend	8.50	B8,A0
60	7:42:21	-28:03	6.29	6.59	Blend	7.58	B7IV/V,B4IV
61	7:42:59	-22:37	...	8.36	Blend	8.68	B8IIIp,B2/B3II
62	7:43:34	-26:28	...	8.52	Blend	8.64	A2,B6Ib
63	7:43:37	-32:53	...	8.65	SAO 209242	9.00	B9.5V
64	7:43:44	-32:25	6.67	6.87	Blend	7.60	B6V,A9V
65	7:44:06	-33:21	...	9.50	Blend	9.2P	B9.5V,A0
66	7:44:30	-26:21	7.53	8.01	Blend	9.0P	B5II,B,B
67	7:44:35	-25:10	...	9.09	HD 161626	8.60	A0IV/V
68	7:45:09	-32:39	...	7.93	HD 161665	7.40	A3V
69	7:45:19	-26:58	4.80	5.05	HD 161756	6.35	B4IVe
70	7:45:42	-16:46	...	8.13	HD 161822	8.00	B9.5/A0V
71	7:45:52	-25:44	7.90	8.04	HD 161851	8.50	Ap
72	7:45:59	-31:42	3.60	3.82	HD 161840	4.80	B8V
73	7:46:05	-24:19	...	8.61	Blend	8.98	B7Ib/II,O
74	7:46:06	-31:15	5.90	6.17	Blend	7.66	B0.5II,B6II/III
75	7:46:12	-27:27	7.67	7.82	SAO 185795	8.90	B1/B2III
76	7:46:13	-32:55	...	7.88	Blend	7.69	A3IV,B2/B3II
77	7:46:24	-25:58	7.78	8.04	HD 161984	9.60	B9III
78	7:46:36	-19:59	...	7.97	Blend	7.47	A3V,O
79	7:46:55	-26:37	7.90	8.18	SAO 185816	9.80	B9
80	7:47:08	-25:25	8.27	8.71	HD 162081	9.60	B9III
81	7:47:08	-26:19	6.27	6.73	SAO 185823	8.00	B7/B8V
82	7:47:10	-23:07	7.34	7.61	HD 162099	8.20	B3IV
83	7:47:10	-27:03	...	8.17	HD 162083	6.80	A3V
84	7:47:16	-19:25	...	8.38	...	...	...
85	7:47:54	-33:50	...	8.00	Blend	8.38	A0V,B8/B9III
86	7:47:54	-30:57	7.54	7.59	Blend	8.0P	B9IV,B9
87	7:48:02	-27:50	6.62	6.94	SAO 185840	8.60	B7/B8III
88	7:48:04	-30:33	5.94	5.86	Blend	6.40	A0Vn,B9.5V
89	7:48:20	-30:17	7.23	6.99	Blend	8.54	B8/B9II,B3:IV:pe
90	7:48:32	-27:55	6.65	6.99	CPD-27 5811	9.3P	B8

TABLE 4—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	Spectral Type
91	7:48:44	-28:37	5.74	6.13	SAO 185852	8.60	B3II/III
92	7:48:51	-19:31	...	8.57	HD 162434	6.90	A9V
93	7:48:55	-26:54	6.25	6.53	SAO 185863	8.10	B5III
94	7:49:11	-22:39	...	8.68	HD 162492	7.30	A5IV/V
95	7:49:13	-20:03	8.36	8.21	Blend	7.74	A0III,A1IV/V
96	7:49:20	-19:07	...	7.17	HD 162563	7.30	A1V
97	7:49:26	-27:04	6.43	6.56	SAO 185879	8.10	B5III
98	7:49:36	-31:37	6.36	6.83	SAO 209398	8.60	B2/B3V
99	7:49:52	-24:30	...	7.84	HD 162603	10.10	B4III
100	7:49:56	-28:52	7.20	7.07	SAO 185888	9.40	B8IV
101	7:49:57	-24:40	...	5.96	Blend	8.15	O,A0III
102	7:50:04	-33:45	...	8.04	Blend	8.71	A1V,A3V
103	7:50:06	-27:36	...	8.15	SAO 185892	7.70	A4IV
104	7:50:08	-22:20	...	8.63	Blend	9.56	B8Ib/II,B8II
105	7:50:11	-28:03	6.84	7.05	Blend	8.2P	B8/B9II,A0,A2
106	7:50:11	-25:59	8.19	8.29	Blend	8.6P	B8/B9Ib,B9,A5
107	7:50:12	-26:39	...	9.14	...	...	...
108	7:50:23	-27:16	...	7.26	Blend	6.68	AIII/IV,A0
109	7:50:26	-28:58	...	7.29	HD 162742	8.43	B4Ib/II
110	7:50:55	-30:12	7.44	8.21	Blend	8.7P	B2/B3Ib,B5,A0
111	7:51:03	-24:49	...	5.39	Blend	8.50	O,B9III
112	7:51:09	-31:14	8.29	8.29	Blend	8.66	B8V,B
113	7:51:22	-29:46	6.91	7.06	Blend	8.18	B3Ib/II,B3II,B2IV-V:p
114	7:51:24	-33:57	6.51	6.10	Blend	6.79	B9IV/V,B9.5V,A0V
115	7:51:36	-33:00	7.97	7.51	CPD-32 4954	10.10	B6III
116	7:51:42	-33:12	6.99	7.24	HD 162910	9.11	B2II/III
117	7:51:46	-24:53	3.46	3.90	HD 162978	6.20	O8III
118	7:51:56	-22:58	7.96	8.12	HD 163017	8.30	B2II/III
119	7:52:01	-26:17	7.13	7.71	SAO 185934	8.70	B7/B8III
120	7:52:04	-26:06	7.50	7.92	LS 4483	10.8P	B
121	7:52:10	-28:20	...	9.45	SAO 185937	9.80	B5II/III
122	7:52:14	-34:19	...	6.05	Blend	7.4P	B9V,B4III
123	7:52:31	-30:34	6.41	6.40	Blend	6.95	B9.5II/I,B1Iab,B9IV
124	7:52:31	-24:31	...	6.20	HD 163161	10.50	B9III/IV
125	7:52:33	-24:03	8.11	8.58	Blend	9.2P	B4Ib/II,A7
126	7:52:47	-31:51	...	7.56	Blend	8.6P	B9III,B8/B9III,A0
127	7:52:54	-34:12	...	6.72	Blend	7.80	B9IV,B6III,B8
128	7:52:59	-18:47	8.25	6.44	HD 163245	6.52	A1V
129	7:53:05	-32:28	7.21	6.72	HD 163181	6.43	B0Ia
130	7:53:05	-25:29	...	7.55	HD 163226	10.90	B7II
131	7:53:07	-25:40	6.25	6.47	Blend	7.6P	B6/B7III,A7
132	7:53:15	-21:57	...	7.40	HD 163296	6.85	A1V
133	7:53:29	-15:46	6.64	5.64	HD 163336	5.89	A0V
134	7:53:34	-28:04	...	6.76	HD 163318	5.78	A7V:
135	7:53:34	-29:54	7.80	7.67	Blend	7.54	B9.5III,A3IV
136	7:53:40	-32:41	6.74	6.47	HD 163274	6.70	B9III/IV
137	7:53:46	-30:17	6.96	7.60	HD 163338	8.51	B1/B2III
138	7:53:48	-27:08	6.58	6.90	Blend	7.94	B5II,A5
139	7:53:49	-33:24	8.25	7.86	Blend	7.8P	B9.5III,B8,A1V
140	7:54:01	-25:00	6.19	6.64	Blend	8.07	B3V,A6IV
141	7:54:01	-30:39	6.67	6.99	Blend	8.47	B5III,B2II
142	7:54:02	-31:30	6.40	6.64	Blend	7.7P	B8III,B2/B3III,A0V,A
143	7:54:06	-23:09	...	8.79	HD 163451	10.10	B3II/III
144	7:54:20	-32:03	5.47	5.94	HD 163430	8.18	B2II
145	7:54:20	-25:23	8.25	8.43	Blend	9.2P	B4ne,A
146	7:54:26	-31:00	6.54	6.97	HD 163454	8.24	O/Be
147	7:54:33	-29:33	7.54	9.46	Blend	9.16	B7III,B1II:n
148	7:54:44	-34:28	...	7.95	Blend	8.8P	B8Ib/II,A2
149	7:54:46	-33:57	8.86	7.71	SAO 209527	8.20	B9V
150	7:54:52	-30:03	6.36	6.62	HD 163555	7.63	Asp
151	7:54:56	-29:04	6.48	6.45	SAO 186005	9.40	B6V
152	7:54:57	-32:58	7.35	7.83	Blend	9.75	B5III,B5
153	7:54:58	-28:10	6.33	6.72	Blend	7.98	B9,B1Iab:
154	7:55:02	-20:36	...	9.13	Blend	9.1P	B6Ib/II,A2
155	7:55:14	-29:14	7.73	7.42	SAO 186016	9.60	B9III
156	7:55:24	-24:00	7.53	6.48	Blend	8.9P	A0,A,B6Ib/II
157	7:55:26	-27:31	6.29	6.73	Blend	7.81	B5III/IV,B8,A0V,B8Ib
158	7:55:29	-28:45	3.62	4.09	HD 163685	6.01	B3IV
159	7:55:32	-30:56	7.45	7.22	CPD-30 5098	10.4	B2/B3Ib
160	7:55:32	-22:32	...	4.92	HD 163800	7.01	O7/O8
161	7:55:50	-21:47	8.31	8.62	HD 313481	10.0P	B9
162	7:55:54	-25:11	...	9.25	HD 163777	9.29	B0.5Ia/II
163	7:56:03	-23:19	6.01	6.28	HD 163811	8.30	B3III
164	7:56:04	-20:03	7.04	7.37	HD 163848	8.00	B8V
165	7:56:05	-15:11	7.52	...	Blend	8.61	B8II,A0
166	7:56:09	-25:50	6.32	6.66	HD 163813	7.99	B6III
167	7:56:10	-30:14	7.75	7.73	Blend	8.8P	B4III,B8
168	7:56:11	-26:23	...	8.06	Blend	9.03	B8,B3:V
169	7:56:11	-30:38	7.28	7.51	Blend	8.19	B9,B8
170	7:56:11	-29:29	8.52	8.83	HD 163816	8.96	B9Ib
171	7:56:21	-22:29	3.72	4.41	HD 163892	7.45	B0.5/B1I
172	7:56:31	-33:39	6.94	6.27	Blend	8.91	B5II/III,B9
173	7:56:35	-23:47	4.71	5.72	HD 163955	4.76	B9V
174	7:56:42	-33:54	7.56	7.31	HD 163899	8.32	B2Ib/II
175	7:56:43	-33:25	4.91	5.27	HD 163868	7.38	B5Ve
176	7:56:53	-25:05	7.15	7.27	Blend	7.7P	B8II/III,A0Iab/Ib,B,
177	7:56:54	-22:33	3.92	4.43	HD 164002	7.42	B1/B2II
178	7:57:09	-23:18	6.41	6.71	HD 164030	10.90	B5III
179	7:57:15	-29:49	5.06	5.50	Blend	6.88	B1Ib,B3IV,B5III
180	7:57:18	-21:29	...	10.04	Blend	8.6P	B7Ib/II,A0,A3

TABLE 4—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	Spectral Type	No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	Spectral Type
181	7:57:21	-23:31	6.37	6.63	CPD-23 6722	9.30	B5	226	7:59:52	-26:14	6.68	7.48	SAO 186180	7.10	A0III/IV
182	7:57:22	-27:42	6.78	7.09	HD 186082	9.96	B9	227	7:59:57	-25:44	8.02	8.20	Blend	9.4P	B7/B8II,O
183	7:57:33	-18:35	7.53	7.73	Blend	7.8P	B9.5V,?+,?+	228	8:00:06	-20:28	···	7.65	HD 164677	9.50	B5Ib/II
184	7:57:33	-17:47	7.48	7.92	Blend	9.1P	?+,B2/B3II,B	229	8:00:10	-27:51	7.37	7.69	Blend	8.22	A,B8,B9.5III
185	7:57:35	-24:41	5.63	6.18	Blend	7.6P	B2III,A1/A2IV,A0,B	230	8:00:12	-17:25	5.62	5.93	HD 164700	8.10	B3III
186	7:57:36	-28:42	6.24	6.37	Blend	8.53	B0Ia,B5III	231	8:00:19	-27:32	7.90	7.37	SAO 186182	9.00	B5Ib
187	7:57:43	-15:01	6.73	···	Blend	8.11	B3II/III,B8/B9II	232	8:00:25	-22:37	3.14	···	HD 164637	6.74	B0Ib/II
188	7:57:47	-15:47	6.52	6.96	HD 164188	8.70	B1Ib/II	233	8:00:26	-17:36	5.73	5.96	HD 164738	7.10	B3III
189	7:57:47	-24:12	4.62	5.11	Blend	7.58	B2II/III,B3II/III,B8	234	8:00:29	-23:07	5.43	···	HD 164739	8.46	B8/B9III
190	7:57:49	-25:15	···	9.04	Blend	9.5P	B9II/III,O,B1	235	8:00:31	-26:52	6.85	6.99	HD 164719	7.99	B3Ib
191	7:57:54	-22:15	5.20	6.72	Blend	8.78	B3III,O	236	8:00:33	-32:25	7.73	···	Blend	9.31	A1,B6II,B5II/III
192	7:57:55	-23:32	6.96	6.92	Blend	8.47	B9IV,B8/B9II,O	237	8:00:37	-28:43	7.83	7.62	SAO 186192	7.90	B9IV
193	7:57:56	-20:59	···	8.23	HD 164224	8.51	Ap	238	8:00:38	-25:18	7.12	7.53	HD 164741	9.00	B2Ib/II
194	7:58:01	-31:57	7.19	7.33	CPD-31 5209	10.60	B8/B9II	239	8:00:40	-23:21	5.95	6.26	Blend	8.39	B5,B4III:
195	7:58:04	-28:58	···	7.96	SAO 186102	9.50	B9III	240	8:00:44	-22:51	3.51	···	Blend	6.78	B1/B2II,B2II
196	7:58:05	-20:49	···	7.77	Blend	8.8P	B2/B3:,A0	241	8:00:45	-25:29	···	7.44	Blend	8.5P	B8/B9III,B8II/III,A3
197	7:58:09	-18:05	7.08	7.43	Blend	7.68	A0,B9V	242	8:00:49	-27:43	7.00	7.31	Blend	9.54	A0IV;,B8
198	7:58:17	-29:35 [B	6.91	6.85	SAO 186109	7.40	B9III	243	8:00:53	-24:21	2.05	2.54	NGC 6530	5.64	O8Iab,O
199	7:58:23	-32:43	7.49	7.32	Blend	8.20	B9V,WC	244	8:00:54	-27:19	5.74	6.86	Blend	7.54	B9II/III,B2III
200	7:58:24	-27:40	5.69	6.26	HD 164295	9.1	B9.5V	245	8:01:04	-19:29	···	8.72	HD 164860	8.30	A0II
201	7:58:35	-27:57	7.51	7.40	Blend	8.8P	B7/B8Ib,A,A2	246	8:01:05	-31:38	6.76	6.90	HD 164798	8.07	B2/B3II
202	7:58:36	-22:08	4.36	5.07	HD 164359	7.53	B1II	247	8:01:06	-19:49	···	8.10	Blend	7.98	A0II/III,B7:
203	7:58:41	-34:36	···	8.21	HD 321133	10.0P	A3	248	8:01:11	-22:30	3.11	···	NGC 6531	···	···
204	7:58:45	-23:10	4.03	···	Blend	7.99	B1/B2Ib,A2III	249	8:01:14	-34:25	···	7.88	CPD-34 7564	10.20	B6II
205	7:58:46	-24:09	4.19	···	HD 164385	8.04	B2III	250	8:01:18	-27:37	···	6.97	HD 317049	10.P	F8
206	7:58:50	-32:03	7.22	7.16	SAO 209617	8.60	A0III	251	8:01:22	-30:51	7.98	8.36	HD 164868	9.66	B3II/III
207	7:58:50	-16:27	7.68	8.10	HD 164414	8.20	B4/B5II/	252	8:01:23	-21:18	···	10.35	LS 4601	12.3P	B
208	7:58:52	-22:47	2.90	···	NGC6514	5.84	B0Iab/b	253	8:01:24	-17:22	7.41	7.12	HD 164945	7.30	B9II/III
209	7:58:54	-19:07	5.97	6.25	HD 164438	7.48	B0.5Ib	254	8:01:25	-20:40	···	7.82	Blend	8.5P	B8/B9Ib,B5Ib/II,A0,A
210	7:58:54	-34:14	···	6.94	Blend	8.6P	A0Ib/II,A	255	8:01:30	-25:11	···	8.26	Blend	9.81	A1III,B8II
211	7:58:54	-27:31	5.21	5.89	HD 164404	8.00	B2V	256	8:01:39	-15:39	7.79	7.95	BD-15 4800	9.20	B5
212	7:58:56	-26:27	···	8.35	SAO 186136	9.60	B9.5III	257	8:01:40	-28:31	7.52	8.02	Blend	8.71	A1IV,A6III/IV,B7/B8V
213	7:58:59	-29:16	···	6.17	Blend	8.5P	B9IV/V,B5II,A0,A0IV	258	8:01:42	-15:20	7.62	···	HD 165049	8.18	B2Ib/II
214	7:59:18	-19:37	8.30	9.01	Blend	9.2P	B5II/III,B+	259	8:01:42	-20:51	···	7.57	Blend	8.13	B9II,B5:Ib:,B2/B3II
215	7:59:19	-23:02	3.40	3.88	NGC 6514	5.82	OV	260	8:01:45	-23:36	5.39	6.14	Blend	8.48	B2/B3II,O
216	7:59:22	-28:34	···	9.64	SAO 186146	9.80	B7Ib	261	8:01:50	-30:12	7.54	7.67	SAO 209678	8.50	B9III/IV
217	7:59:23	-26:06	···	7.97	SAO 186147	9.40	B9III	262	8:01:53	-24:41	3.94	2.83	HD 165016	7.33	B2Ib
218	7:59:26	-33:55	4.71	5.10	HD 164455	7.42	B2.5III	263	8:01:58	-27:33	···	7.46	Blend	8.5P	A5V,A0,A5
219	7:59:26	-17:51	7.95	7.93	Blend	9.14	B4II/III,B8/B9IV:	264	8:02:03	-27:07	···	7.07	Blend	9.16	A6III,B8Ib/II
220	7:59:32	-30:57	···	8.17	SAO 209635	8.60	B9IV	265	8:02:04	-24:24	2.98	···	NGC 6530	···	···
221	7:59:33	-29:57	7.94	7.89	CD-29 14408	11.4	B9.5III	266	8:02:07	-29:03	···	6.50	Blend	8.78	BII/III,B8/B9III,B7
222	7:59:35	-21:31	···	8.23	HD 164582	8.20	A0IV	267	8:02:07	-27:41	···	6.65	SAO 186249	9.60	B9
223	7:59:35	-24:15	3.40	···	Blend	6.87	O9III:,B	268	8:02:12	-28:47	8.17	8.86	CPD-28 6255	11.10	B7/B8V
224	7:59:37	-20:45	4.54	5.18	HD 164581	6.81	B2/B3II	269	8:02:13	-22:59	7.21	7.44	Blend	9.0P	B,B8II,WN
225	7:59:38	-29:22	4.99	5.39	HD 164516	7.91	B3II	270	8:02:24	-21:09	···	8.31	HD 165151	8.90	B9III

1995ApJS...96..605S

TABLE 4—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	Spectral Type
271	8:02:24	-21:48	...	8.80	Blend	8.5P	A0,A0,A0,A5
272	8:02:25	-23:43	4.77	5.37	HD 165132	8.07	B5/B6Ib
273	8:02:29	-21:58	...	10.32	Blend	9.2P	B8II,A3
274	8:02:37	-19:46	6.15	6.42	HD 164202	6.80	B9V
275	8:02:40	-26:34	6.71	6.97	Blend	8.2P	B8II,B3Ib/II,A0,A0
276	8:02:48	-34:34	...	6.13	Blend	8.17	B8II,B4V:
277	8:02:51	-26:59	5.64	6.30	Blend	8.23	B2II/III,A1V
278	8:02:53	-29:25	5.05	5.56	HD 165207	8.26	B2IV
279	8:02:54	-31:30	6.35	6.65	Blend	7.6P	B8,B8,B0,A,A3
280	8:02:56	-22:10	5.54	6.45	Blend	7.8P	B4V,B3V,B5,A0
281	8:02:58	-24:12	4.25	...	Blend	7.50	O9III:,B2III/IV
282	8:03:00	-19:57	6.80	6.84	HD 165285	9.01	B1/2(I)NN(E)
283	8:03:00	-34:21	5.89	6.04	HD 209711	7.90	B5III/IV
284	8:03:06	-22:28	6.16	6.82	Blend	8.8P	B2III,B8
285	8:03:13	-27:43	...	6.57	Blend	8.7P	B5,A,B9.5IV,B9II
286	8:03:17	-28:33	6.61	...	Blend	10.18	B8Ib/II,A0/A1III
287	8:03:18	-21:29	...	5.94	HD 165302	9.20	B5III
288	8:03:18	-22:43	7.33	7.65	Blend	8.4P	B,A0,B,A3
289	8:03:20	-21:40	...	6.61	Blend	9.3P	B3,B5
290	8:03:24	-32:23	7.48	7.57	Blend	8.3P	B7II,B9,A2
291	8:03:27	-23:58	6.02	...	Blend	9.0P	B,B5,A0
292	8:03:33	-20:28	6.79	7.36	Blend	8.60	B3II,B8Ib
293	8:03:35	-26:43	...	7.60	Blend	9.3P	A0,A0III
294	8:03:38	-28:22	5.79	6.08	HD 165365	8.00	B7/B8III
295	8:03:46	-29:04	6.29	6.35	Blend	7.24	B9III,A0II/III
296	8:03:50	-27:30	8.04	8.71	SAO 186292	10.60	B2II/III
297	8:03:52	-35:04	...	6.85	SAO 209746	8.60	B8/B9II
298	8:03:53	-26:07	5.88	6.53	Blend	8.80	B3II,B4II
299	8:03:55	-22:35	6.85	7.86	Blend	8.4P	B8,A5,B8,A0
300	8:04:01	-22:24	...	8.45	Blend	8.4P	B9,A0,A2,B9.5III,B9
301	8:04:11	-21:27	4.00	4.56	HD 165516	6.28	B1/B2Ib
302	8:04:12	-30:39	6.79	7.14	SAO 209733	8.80	B5II/III
303	8:04:21	-25:06	7.50	8.01	HD 165517	8.44	B0Ia
304	8:04:30	-26:41	8.24	8.16	Blend	8.6P	B9V,A0,A0/A1IV
305	8:04:33	-25:36	6.53	6.80	HD 165555	8.80	B7II/III
306	8:04:35	-22:07	5.32	5.91	Blend	7.7P	B5III,B3,B7II
307	8:04:37	-34:37	...	6.52	Blend	7.7P	B9II,B1Ib,B9p
308	8:04:40	-29:34	7.71	7.91	CPD-29 5292	10.80	B8
309	8:04:41	-23:07	6.29	6.53	Blend	7.5P	B9III,B,B5
310	8:04:47	-22:54	5.69	6.21	Blend	7.0P	B2III,B5,B,B5
311	8:04:49	-27:09	6.91	7.46	Blend	9.99	B8III,B9IV
312	8:04:59	-27:19	6.71	7.09	SAO 186331	8.80	B8/B9III
313	8:05:02	-25:21	5.92	6.29	HD 165655	8.16	B1Ia/Iab
314	8:05:15	-22:16	4.26	5.07	Blend	8.50	B2IV,B5
315	8:05:25	-28:11	...	9.11	CPD-28 6311	10.90	B8II
316	8:05:30	-21:16	4.24	5.07	HD 165763	7.78	WC
317	8:05:33	-22:43	6.01	6.71	HD 165765	10.00	B2III
318	8:05:35	-16:27	6.31	6.49	Blend	7.45	B3V,B9
319	8:05:39	-26:51	...	8.17	HD 165785	9.44	B1III
320	8:05:41	-34:14	...	6.93	HD 321353	4.0P	?p
321	8:05:43	-31:11	6.55	6.71	Blend	7.50	B9V,B6Ib/II,B9
322	8:05:45	-22:11	4.20	4.90	Blend	7.77	B1/B2II,B2III
323	8:05:48	-19:24	8.26	...	Blend	8.3P	B6Ib,?+,?+,?+,?+
324	8:05:49	-25:29	4.89	5.23	HD 165814	6.61	B4IV
325	8:05:53	-18:59	6.62	6.67	Blend	7.9P	B9V,B9III,?+,?+
326	8:05:56	-23:22	...	6.02	Blend	8.2P	B2III,?,B8,B3II/III,
327	8:05:56	-34:02	6.48	6.33	Blend	8.94	B4III,B8/B9II
328	8:05:57	-17:33	8.72	8.76	HD 165870	9.26	B7III
329	8:06:04	-34:58	...	6.77	HD 165955	9.18	B3Vn
330	8:06:05	-19:53	5.97	6.38	Blend	7.36	B4Ib,B5IV/V,B9V
331	8:06:06	-25:07	8.83	8.11	LS 4695	11.7P	B
332	8:06:08	-17:03	...	7.60	Blend	9.28	B9III,B9.5IV:
333	8:06:09	-22:47	6.25	6.80	HD 165894	9.60	B3IV/V
334	8:06:15	-24:00	4.12	4.83	Blend	6.00	?,B6III:
335	8:06:19	-24:41	7.03	7.61	Blend	8.58	B9IIp,B5IV,B8/B9I
336	8:06:21	-28:04	...	8.06	Blend	9.5P	A,B5Ib/II,B9III
337	8:06:25	-26:20	8.02	8.31	Blend	8.8P	B6V,A3
338	8:06:25	-27:50	...	9.96	HD 165953	10.07	B
339	8:06:34	-19:18	7.35	7.31	Blend	0.0P	B9Ib/II,B9Ib/II,B9II
340	8:06:39	-32:33	7.17	7.55	SAO 209791	9.10	B9III
341	8:06:39	-27:33	...	9.28	Blend	9.7P	A2,B9III
342	8:06:41	-32:08	...	7.72	HD 166003	7.70	A1V
343	8:06:44	-27:01	...	9.20	Blend	10.20	B9III,B8II
344	8:06:46	-23:02	...	7.63	HD 166055	10.09	B8Ib/II
345	8:06:48	-18:52	5.91	6.56	Blend	9.5P	?+,G5/G6III
346	8:06:48	-19:39	9.42	10.00	Blend	8.74	B5II,B4II/III
347	8:06:48	-22:04	6.14	6.54	HD 166054	10.10	B3
348	8:06:49	-24:05	4.56	5.57	Co. 367	6.40	...
349	8:06:49	-23:41	3.86	4.67	Blend	7.56	B1V,B1V,B0.5V,B8,B9II
350	8:07:19	-16:16	8.71	...	HD 166187	8.80	B9.5IV/V
351	8:07:19	-29:53	7.37	7.30	SAO 186397	9.00	B8V
352	8:07:20	-22:24	7.28	6.29	Blend	9.14	B8II,B3
353	8:07:21	-24:27	7.42	8.13	HD 315259	10.21	B9
354	8:07:21	-32:50	7.73	7.58	CPD-32 5172	10.80	B5Ib/II
355	8:07:24	-18:15	...	10.87	Blend	9.19	B3II:e,A0II
356	8:07:26	-25:18	...	8.76	HD 166193	10.40	B9III
357	8:07:26	-23:55	4.44	5.14	HD 166192	8.52	B2II
358	8:07:32	-33:49	2.98	3.58	HD 166197	6.16	B1V
359	8:07:39	-22:13	6.99	7.33	Blend	8.9P	B8,O,B3,B
360	8:07:39	-17:47	7.39	7.68	Blend	8.33	B9V,B5I

TABLE 4—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	Spectral Type
361	8:07:40	-25:39	...	8.10	HD 166217	11.10	B9II/III
362	8:07:40	-19:13	...	8.44	HD 166291	9.06	B3II
363	8:07:41	-16:47	4.92	5.48	Blend	7.13	B1II,B1Ib,B
364	8:07:41	-23:29	6.55	...	Blend	8.51	A0,A0III/IV
365	8:07:46	-22:54	...	9.76	HD 166294	10.10	B7II/III
366	8:07:47	-21:20	6.05	6.69	Blend	7.40	B3/B4III,B9.5Iab,A0I
367	8:07:52	-27:22	...	8.14	Blend	9.41	A1III/IV,A0IV;
368	8:08:03	-32:11	7.85	...	CPD-32 5185	10.80	B9.5Ib
369	8:08:05	-20:54	...	6.83	Blend	8.8P	B8/B9IV,B8
370	8:08:08	-34:28	...	7.34	SAO 209834	9.00	B8/B9III
371	8:08:09	-34:38	...	7.67	Blend	8.0P	B9.5V,A,A
372	8:08:15	-27:07	...	7.99	CPD-27 6228	11.00	B9II/III
373	8:08:17	-19:52	...	7.14	HD 166393	6.36	A2V
374	8:08:22	-32:24	6.84	7.26	HD 166345	8.72	B3Vne
375	8:08:22	-15:54	6.46	6.61	HD 166417	8.20	B9II/III
376	8:08:25	-20:12	6.82	6.70	HD 166421	9.90	B3II/III
377	8:08:27	-20:43	5.77	6.30	HD 166443	8.72	B0.5Iab:ne
378	8:08:28	-29:06	6.82	...	Blend	10.07	B8II,B8/B9IV
379	8:08:28	-31:15	7.84	7.91	CPD-31 5395	10.80	B4II
380	8:08:31	-29:52	6.63	6.75	Blend	7.6P	A0IV/V,B7II/III,A8/A
381	8:08:34	-26:00	7.19	7.59	Blend	9.24	B5II/III,B5II/III
382	8:08:35	-22:07	...	8.85	Blend	9.0P	B0III,B8,B,B
383	8:08:39	-32:39	6.50	6.85	HD 166425	8.23	B6III
384	8:08:40	-25:03	...	8.86	Blend	9.75	B7/B8II,A0IV,B9V
385	8:08:43	-34:06	5.07	5.33	HD 166450	7.30	B4III
386	8:08:46	-23:52	...	6.96	Blend	8.6P	B9II,B8II,A0
387	8:08:47	-15:39	5.17	...	Blend	7.45	B1III:ne,B1/B2Ib,B3I
388	8:08:50	-28:54	5.94	5.91	HD 166469	6.51	B9IVspe
389	8:08:51	-19:04	7.82	8.25	Blend	8.2P	B5II/III,B1II,B+,B
390	8:08:52	-29:34	6.94	7.00	Blend	7.9P	B9V,B9V,A0
391	8:08:55	-16:55	6.38	6.55	HD 166540	8.16	B1Ib
392	8:08:56	-16:04	7.63	...	BD-16 4746	9.50	B9
393	8:08:58	-26:23	...	8.13	SAO 186449	8.80	A0V
394	8:08:59	-20:26	4.11	4.93	HD 166546	7.22	B1Ib
395	8:09:01	-27:24	...	7.77	CPD-27 6241	10.90	B5IV
396	8:09:05	-18:46	7.48	7.83	Blend	8.6P	B2II,B+,WR+
397	8:09:14	-27:55	...	8.34	Blend	9.19	A0V+,B9
398	8:09:18	-17:59	...	8.54	HD 166587	10.00	A1III/IV
399	8:09:20	-21:29	...	6.82	Blend	8.6P	A0,A,A,B8II,B+
400	8:09:21	-19:27	8.25	9.06	HD 166628	7.19	B3Ia/Iab
401	8:09:24	-17:39	...	8.38	Blend	9.65	B2III,A2III/IV
402	8:09:28	-26:45	...	8.06	Blend	9.58	B6Ib,a3
403	8:09:28	-15:22	5.20	...	HD 166716	8.00	B1/B2II
404	8:09:31	-28:14	5.79	6.34	HD 166612	7.39	A2/A3V+
405	8:09:33	-34:58	...	8.21	Blend	8.8P	B9IV/V,A5
406	8:09:34	-16:24	5.26	5.97	HD 166689	7.52	B1Ib
407	8:09:34	-27:07	...	6.86	SAO 186462	10.90	B9
408	8:09:36	-31:33	8.23	8.14	CPD-31 5415	10.30	B7Ib/II
409	8:09:38	-24:38	...	9.23	Blend	9.01	A5,B9III
410	8:09:44	-18:24	5.98	6.43	Blend	7.8P	Ap,B8II,B9III,WR+,B,
411	8:09:44	-21:00	5.33	...	Blend	8.37	B2III,B,B9.5III
412	8:09:53	-32:22	6.88	6.88	Blend	8.8P	B7V,A2,B9,A1/A2IV
413	8:09:53	-22:28	7.46	7.96	Blend	7.8P	B8/B9V,B9,A2,B9,B8,A
414	8:09:54	-15:12	5.31	...	Blend	8.03	B1/B2Ib,B5V:
415	8:09:55	-17:21	...	9.75	Blend	9.6P	B+,B5II/III
416	8:09:58	-19:46	7.87	8.98	HD 166787	8.22	B0.5Ia
417	8:10:02	-20:27	...	6.63	Blend	7.87	B,A0V,B8/B9III,A0m
418	8:10:08	-29:19	...	8.61	Blend	8.59	B9,B8II
419	8:10:13	-29:47	8.13	...	HD 317264	10.00	A0
420	8:10:13	-27:12	5.89	6.40	HD 166789	8.06	B6III
421	8:10:19	-34:21	...	6.46	SAO 209885	7.80	B8/B9III
422	8:10:19	-25:08	...	7.71	HD 166807	7.60	A0III/IV
423	8:10:23	-31:58	5.23	5.50	CPD-31 5421	6.90	B7II
424	8:10:25	-22:43	6.63	7.02	Blend	8.2P	O,B3,B9
425	8:10:34	-23:05	...	10.79	Blend	9.2P	A,A3
426	8:10:35	-18:26	...	6.67	Blend	7.45	Ap,Ap
427	8:10:43	-24:25	...	9.20	HD 166923	10.90	B8II/III
428	8:10:45	-18:50	5.71	5.81	Blend	7.46	B5,B2IV/V,?,?
429	8:10:46	-21:05	3.43	3.75	Blend	7.3P	?,?,B2III,B3
430	8:10:46	-16:35	7.96	...	HD 166963	10.20	B2Ib
431	8:10:47	-15:49	7.98	...	HD 166996	9.80	B2Ib:
432	8:10:51	-25:02	...	8.10	HD 166939	10.10	B8II/III
433	8:10:55	-17:12	...	7.80	Blend	9.28	B8/B9Ib,B3II/III
434	8:11:06	-25:19	6.23	6.79	HD 166967	8.39	B2II
435	8:11:06	-27:30	5.64	5.89	HD 166968	7.16	B8II/III
436	8:11:11	-23:40	...	8.35	Blend	8.79	B3III,B9V,B9III
437	8:11:23	-22:27	...	7.04	Blend	9.2P	B9,A3
438	8:11:24	-27:57	...	9.87	SAO 186515	8.30	F3/F5V
439	8:11:27	-29:31	8.28	8.76	Blend	9.93	B9IV/V,B9V
440	8:11:28	-18:09	6.64	6.93	Blend	7.9P	B6V,B+,B+
441	8:11:29	-23:23	...	11.41	HD 167051	9.80	A0III
442	8:11:29	-28:50	6.11	6.39	HD 167016	7.95	B8III/IV
443	8:11:31	-28:22	6.73	7.06	SAO 186514	9.60	B7II
444	8:11:33	-33:09	4.90	5.32	HD 167003	8.48	B0.5III
445	8:11:35	-34:41	...	5.76	HD 167147	6.80	B9IV
446	8:11:37	-19:05	4.13	...	Blend	8.12	B2Ib/II,B3II
447	8:11:41	-31:22	7.28	7.63	SAO 209904	8.60	B7II/III
448	8:11:41	-21:52	7.28	8.25	Blend	8.4P	B9II/III,A,A3
449	8:11:41	-28:10	...	7.29	CPD-28 6436	12.10	B9.5II/III
450	8:11:45	-17:24	8.33	8.93	HD 167143	9.10	B3III

TABLE 4—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	Spectral Type
451	8:11:52	-17:12	...	7.65	Blend	8.69	A0III/IV,B3II
452	8:11:59	-24:54	...	9.59	...	...	...
453	8:12:00	-28:35	...	7.28	SAO 186536	7.90	A5V
454	8:12:03	-24:01	7.69	7.83	HD 167203	8.28	B7III/IV
455	8:12:06	-22:27	5.82	6.60	HD 167200	9.50	B5
456	8:12:07	-19:57	6.13	5.94	Blend	9.70	B1III,?,O
457	8:12:09	-31:45	7.49	8.19	Blend	9.1P	A2/A3III,B9
458	8:12:14	-20:45	2.68	3.38	HD 167264	5.38	B0.5Ia/I
459	8:12:16	-20:25	2.91	3.60	HD 167263	5.95	B0.5Ib/I
460	8:12:17	-33:07	5.73	5.53	HD 167230	6.80	B9V
461	8:12:21	-16:05	6.47	6.76	Blend	8.89	B9V,A0Ib,B9.5III
462	8:12:25	-23:07	...	8.48	Blend	8.38	Ap,A8/A9V,A2II/III
463	8:12:28	-16:26	7.71	8.12	HD 167333	10.90	B4III
464	8:12:28	-19:00	3.96	...	Blend	6.36	B1Ib,B3Ib/II,B2III,B3
465	8:12:28	-16:52	5.73	6.18	Blend	7.21	B7III,B2II,A0III
466	8:12:34	-18:41	6.41	...	HD 167356	6.07	A0Ia
467	8:12:36	-28:05	6.55	6.81	Blend	8.75	B8/B9Ib,B9.5V,B9.5II
468	8:12:50	-15:55	6.28	6.61	Blend	8.24	B8IV,A0Ib,B5II/III,B
469	8:12:55	-22:32	...	7.67	HD 167414	10.80	B9Ib
470	8:12:57	-29:09	6.36	6.85	Blend	8.31	B5II/III,B4II/III
471	8:12:57	-20:03	5.53	5.95	Blend	7.7P	B3II,B5Ib,B5,B9,B+
472	8:12:59	-31:10	5.97	6.23	HD 167363	7.65	B7II
473	8:13:00	-18:28	5.02	...	Blend	7.81	B5Ib/II,B2III:,B5
474	8:13:02	-18:17	5.55	6.94	HD 167411	7.71	B0.5Ia
475	8:13:04	-17:38	6.10	6.54	Blend	7.39	B7II/III,A2IV
476	8:13:08	-30:07	6.37	6.60	HD 167402	8.96	O9.5/B0I
477	8:13:10	-25:50	...	7.45	Blend	10.07	B8II,B9V
478	8:13:13	-25:33	...	7.16	Blend	9.11	B9II/III,B7II
479	8:13:14	-21:55	...	8.37	Blend	10.20	B5/B6II,B
480	8:13:15	-18:49	4.87	...	HD 167479	8.14	B1/B2Ib
481	8:13:16	-23:29	8.08	8.93	HD 314295	10.00	A7
482	8:13:16	-27:24	...	9.29	SAO 186566	8.40	B9Ib/II
483	8:13:17	-27:11	...	8.98	Blend	9.71	A0/A1II,A6V
484	8:13:21	-24:33	...	8.06	HD 315376	10.11	B3
485	8:13:21	-30:24	6.78	6.89	HD 167441	7.78	B8III/IV
486	8:13:27	-21:24	...	9.11	HD 314221	10.0P	F
487	8:13:28	-21:46	...	8.58	Blend	9.2P	A,A
488	8:13:39	-29:51	5.65	6.19	Blend	8.44	B3II/III,B9IV
489	8:13:43	-25:44	...	7.40	HD 167551	11.10	B9II
490	8:13:43	-25:10	...	8.46	Blend	9.0P	A1IV,B8
491	8:13:44	-22:59	...	9.16	Blend	9.2P	B8,B9III
492	8:13:50	-17:23	...	7.94	Blend	7.1P	K2III,B9III,A0,B8/B9
493	8:13:52	-18:42	5.63	...	HD 167636	9.56	B5III:
494	8:13:56	-32:58	6.39	6.61	SAO 209952	8.30	B5III
495	8:13:56	-16:32	5.68	6.26	Blend	7.87	Oe,B2/B3III
496	8:14:00	-18:59	4.76	...	Blend	7.12	B8Ib,B0,B2
497	8:14:04	-31:18	5.96	6.12	HD 167599	7.33	B7/B8II
498	8:14:06	-34:09	3.60	3.91	HD 167647	6.16	B3V+
499	8:14:11	-19:50	...	5.67	NGC 6595	7.00	...
500	8:14:15	-28:38	...	7.66	HD 167666	6.18	A7V:
501	8:14:18	-25:32	...	8.65	V1959 Sgr	12.6P	?
502	8:14:24	-34:44	...	5.83	HD 167846	6.92	B7/B8III
503	8:14:29	-30:11	7.17	7.40	SAO 209964	9.50	B6III
504	8:14:29	-33:25	5.80	5.99	HD 167686	7.02	B8II
505	8:14:31	-29:05	6.88	7.35	CPD-29 5474	10.40	B8Ib/II
506	8:14:31	-18:30	4.20	...	HD 167771	6.54	O8/O9
507	8:14:33	-27:54	6.17	6.58	Blend	8.93	AREDO
508	8:14:40	-33:51	...	6.90	SAO 209973	9.00	B8/B9IV
509	8:14:40	-16:18	6.82	7.35	Blend	8.51	A0,B9Ib,B7/B8II
510	8:14:40	-19:43	4.11	4.95	Blend	7.34	B1/B2III,B2III
511	8:14:44	-17:59	...	6.07	Blend	9.4P	B7Ib/II,A
512	8:14:47	-23:18	5.88	6.34	Blend	7.59	B8V,B6II
513	8:14:49	-29:15	6.54	7.00	HD 167775	8.60	B5IV/Vne
514	8:14:49	-34:27	...	5.91	CPD-34 7739	10.40	B8II
515	8:14:50	-23:37	7.47	7.70	Blend	8.64	B9/B9.5V,B9II/III
516	8:14:52	-29:43	7.23	7.49	SAO 186615	9.10	B8II
517	8:14:52	-21:19	...	9.04	HD 314218	10.0P	B8
518	8:14:53	-18:50	4.77	...	HD 167863	6.71	B6II/III
519	8:15:00	-27:25	...	8.74	Blend	9.64	B7III,A1V
520	8:15:04	-28:52	...	9.06	CPD-28 6507	11.10	B9V
521	8:15:05	-26:09	...	8.13	Blend	10.53	B9II,A0V
522	8:15:07	-25:06	...	7.59	Blend	8.59	B8/B9Ib,B5
523	8:15:14	-22:01	8.55	8.67	Blend	9.0P	B8/B9IV,A2,A0IV/V
524	8:15:22	-23:09	...	7.16	HD 167931	10.10	A0/A1IV
525	8:15:31	-24:23	...	8.14	Blend	9.24	B7/B8II,B8/B9III,B8I
526	8:15:37	-22:34	7.25	8.04	Blend	8.5P	B7II,A0,A3
527	8:15:42	-20:46	...	7.76	Blend	8.3P	A0,A,A5,A5,B8Ib
528	8:15:42	-20:04	7.11	7.33	Blend	9.4P	redo with just B2III
529	8:15:47	-18:39	4.66	...	Blend	6.48	B0Ia/Iab,B5
530	8:15:47	-21:28	...	7.92	HD 168082	9.30	B9.5V
531	8:15:48	-22:59	7.58	7.92	Blend	9.90	B8III/IV,B8Ib/II
532	8:15:52	-21:18	...	7.69	Blend	9.34	B6/B7Ib,B9III/IV
533	8:15:52	-18:12	4.74	...	Blend	7.47	B1Ib/II,O
534	8:15:54	-28:13	7.19	7.75	HD 168056	8.89	B8IV
535	8:15:59	-26:43	...	9.54	SAO 186637	8.50	B9V+
536	8:16:03	-19:29	6.27	6.80	Blend	8.2P	B2III,B5,A0,A0/A1IV
537	8:16:07	-17:55	5.93	6.76	Blend	8.7P	B8Ib/II,B2Ib,B5
538	8:16:16	-29:01	6.94	7.28	SAO 186642	8.60	B8/B9III
539	8:16:24	-25:40	...	8.43	Blend	9.1P	B8/B9II,A
540	8:16:30	-28:27	7.40	7.88	SAO 186652	9.90	B5II/III

TABLE 4—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	Spectral Type
541	8:16:51	-21:45	8.57	9.01	Blend	9.54	B8/B9III,B9II/III
542	8:16:53	-22:23	...	8.83	Blend	8.5P	B9II,A2,A2,A2
543	8:16:54	-32:22	6.13	6.22	Blend	7.06	A4IV,B8III/IV,B9III,
544	8:17:00	-24:37	7.78	8.30	Blend	8.8P	B5Ib,B8Ib,B8
545	8:17:00	-26:10	...	9.55	SAO 186663	9.30	B9.5V
546	8:17:06	-24:57	...	8.26	HD 168331	9.27	B6/B7III
547	8:17:12	-24:07	...	8.37	Blend	9.70	B9,B9IV
548	8:17:15	-17:07	6.06	6.41	NGC 6613	7.37	...
549	8:17:21	-33:21	...	7.81	HD 168400	7.00	A2IV/V
550	8:17:22	-22:10	...	8.89	Blend	8.6P	B9IV,B9,A2,A0/A1IV
551	8:17:22	-20:32	6.90	7.87	HD 168421	9.57	B2/B3Iab
552	8:17:32	-23:20	...	9.34	HD 168434	10.40	B9.5III
553	8:17:37	-25:28	...	7.72	HD 168524	9.70	B8/B9II
554	8:17:46	-17:46	6.47	7.14	Blend	7.7P	B1Ib,B1Iab/Ib,B5,B8,
555	8:17:49	-20:59	...	11.83	Blend	8.8P	A,A,A5
556	8:17:51	-28:20	...	8.04	SAO 186684	9.30	B8/B9V
557	8:17:52	-25:37	...	7.73	Blend	9.70	A2III,A1I/II
558	8:17:53	-19:58	...	9.75	HD 168522	9.10	A0III
559	8:17:58	-33:40	...	7.59	SAO 210031	9.50	B8II
560	8:18:04	-17:14	...	6.59	HD 168552	8.09	B2/B3Ib
561	8:18:04	-30:57	5.61	6.00	HD 168493	6.90	B6V
562	8:18:06	-21:50	...	9.12	Blend	10.04	B8/B9II:,B9IV
563	8:18:06	-22:56	...	6.99	Blend	8.6P	B6Ib,A2,A2,B9Ib/II
564	8:18:08	-26:05	...	8.26	HD 168525	6.70	A6V
565	8:18:08	-32:15	7.21	6.74	Blend	6.96	A5IV,B9II/III
566	8:18:39	-33:35	...	7.72	SAO 210052	9.30	A1V
567	8:18:45	-23:10	...	7.96	CPD-23 7052	9.00	A5
568	8:18:47	-17:21	...	6.72	HD 168673	9.50	B7Ib
569	8:18:47	-17:56	7.17	8.30	Blend	9.19	B2Ib/II,A0/A1IV
570	8:18:52	-28:25	...	7.59	HD 168646	6.16	A3III
571	8:18:53	-22:04	...	8.21	Blend	7.3P	A2IV,A2,A0,A0,A0,A2
572	8:18:59	-25:22	...	8.11	Blend	7.5P	?p,B8II,A2/A3IV:
573	8:19:00	-22:18	...	7.89	HD 168707	8.00	A0V
574	8:19:04	-22:56	5.73	6.17	HD 168708	7.10	B8IV
575	8:19:05	-28:55	8.88	8.76	SAO 186720	9.80	B3II/III
576	8:19:06	-28:09	...	8.57	SAO 186723	8.80	A4IV
577	8:19:09	-24:54	...	8.86	HD 168709	8.80	B9.5II
578	8:19:18	-26:26	5.80	6.47	HD 168750	8.27	B1Ib
579	8:19:22	-20:21	...	9.16	Blend	9.2P	F8,G5
580	8:19:24	-20:06	...	8.98	HD 313321	9.14	B0.5II
581	8:19:27	-26:54	...	7.37	Blend	8.13	A0,B9III
582	8:19:36	-30:10	5.70	6.31	HD 168785	8.49	B2IIIp
583	8:19:44	-17:25	6.23	6.92	Blend	8.20	B8Ib/II,B2IVnn,B3II,
584	8:19:52	-18:46	9.46	9.17	HD 168878	9.80	B8/B9II
585	8:20:00	-17:42	6.79	7.14	Blend	7.3P	A1IIp,A0,A0,A0,A0
586	8:20:01	-22:37	...	8.36	Blend	8.3P	B8Ib/II,A3,A2,A
587	8:20:06	-19:02	...	9.37	Blend	9.4P	A,B9Ib/II,B9II
588	8:20:13	-20:36	...	8.91	Blend	8.8P	B8/B9II,B5,A
589	8:20:22	-27:30	...	8.39	HD 168942	7.90	B9.5V
590	8:20:22	-26:58	6.48	7.03	HD 168941	9.34	O9.5II
591	8:20:26	-34:29	...	3.03	HD 169022	1.80	B9.5III
592	8:20:34	-23:05	7.12	7.45	Blend	9.18	B7/B8III,B9II/III
593	8:20:37	-17:12	...	7.39	Blend	9.65	B2/B3Ib,B1/B2Iab
594	8:20:45	-19:19	8.03	8.25	Blend	8.9P	B9,A2,B6Ib
595	8:20:45	-28:39	...	9.15	SAO 186761	9.50	B9III
596	8:20:48	-21:57	7.23	7.95	HD 169089	9.50	B5II
597	8:21:00	-26:09	7.53	7.89	HD 315643	10.01	B2
598	8:21:00	-19:54	...	8.12	HD 313315	10.00	A
599	8:21:05	-33:19	...	8.16	SAO 210102	8.40	A0V
600	8:21:12	-30:41	...	7.97	SAO 210101	8.00	A1V
601	8:21:16	-19:37	6.47	6.96	HD169174	8.40	B8III
602	8:21:27	-21:56	...	7.61	Blend	9.3P	A1/A2III,B9II/III
603	8:21:34	-26:31	6.98	7.63	SAO 186780	9.00	B4III
604	8:21:41	-19:44	6.66	6.96	Blend	7.8P	?,B8
605	8:21:44	-18:19	...	9.48	Blend	8.6P	B3II,B9,B9Ib
606	8:21:48	-18:46	7.13	7.63	Blend	7.8P	B,B9,B9,A0,A0,A0,B9I
607	8:21:57	-33:08	...	8.20	Blend	8.23	A1IV,B8V,B9V
608	8:22:01	-24:25	...	8.41	HD 169292	8.50	B9III/IV
609	8:22:02	-30:57	6.92	7.19	SAO 210120	8.40	B6III
610	8:22:04	-34:02	...	4.42	HD 169398	6.30	B5IV
611	8:22:18	-21:45	...	8.18	Blend	8.5P	B9II/III,A2,A2,A0
612	8:22:22	-20:35	7.18	7.59	Blend	4.81	K1/K2III,A1/A2V [a]
613	8:22:39	-31:47	5.52	5.92	HD 169425	7.37	B5III
614	8:22:53	-27:21	7.47	7.84	SAO 186803	8.80	B8V
615	8:22:54	-21:33	...	8.17	Blend	9.0P	A0,A3,B8II
616	8:23:15	-18:34	6.90	7.48	Blend	8.45	B5II/III,B8Ib/II
617	8:23:29	-20:18	...	8.94	Blend	8.6P	B8,A0,A5,B9Ib/II
618	8:23:34	-21:16	...	10.27	Blend	11.9P	M6,M8
619	8:23:38	-23:25	5.77	6.32	Blend	7.89	B5II,B3III
620	8:23:50	-21:33	8.11	8.40	HD 169704	10.00	B5Ib/II
621	8:23:53	-29:32	7.71	7.79	SAO 186825	8.60	B9V
622	8:23:53	-17:42	7.18	6.94	Blend	8.0P	B9.5V,B5,B9
623	8:23:54	-26:33	8.21	7.71	CPD-26 6453	10.20	B8III/IV
624	8:24:13	-17:16	...	7.93	Blend	7.48	A3III/IV,B9.5II,B9II
625	8:24:16	-18:59	6.04	6.71	HD 169805	8.10	B2Vne
626	8:24:26	-26:57	...	8.20	SAO 186839	9.14	F3V
627	8:24:28	-22:39	...	9.39	Blend	9.3P	A2,B9
628	8:24:35	-33:24	...	7.59	HD 169873	8.74	B8/B9III
629	8:24:48	-26:41	...	6.46	Blend	5.54	A3/A4V,A8V+
630	8:24:50	-32:31	5.94	6.57	HD 169872	7.77	B8II

TABLE 4—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	Spectral Type
631	8:24:55	-25:41	···	8.88	HD 169917	10.30	B8Ib/II
632	8:24:59	-24:34	···	8.57	HD 169937	8.00	B9.5IV
633	8:25:01	-25:21	···	7.35	HD 169916	2.81	K1IIIb
634	8:25:02	-17:50	4.67	5.22	HD 169990	6.20	B8III/IV
635	8:25:03	-26:12	8.13	8.36	SAO 186846	9.10	B8/B9II
636	8:25:05	-20:50	···	7.87	Blend	8.3P	B9II,B8/B9II,A0,B9II
637	8:25:21	-21:03	···	8.42	HD 314548	10.P	B8
638	8:25:21	-22:50	···	8.41	Blend	8.3P	B8/B9II,A0,A0,A5
639	8:25:45	-34:03	···	5.68	HD 170213	6.90	B8V
640	8:25:49	-21:24	···	8.30	Blend	8.5P	B9III,B9
641	8:25:52	-27:17	···	8.79	HD 170122	8.86	B9III
642	8:25:55	-19:16	···	7.62	HD 170179	9.40	B9II/III
643	8:26:00	-26:38	7.32	6.57	HD 170141	6.50	A3III
644	8:26:08	-32:50	···	8.27	SAO 210224	8.40	A0V
645	8:26:13	-32:16	···	7.48	CPD-32 5401	10.30	B2III
646	8:26:18	-33:36	···	6.09	Blend	7.57	B8V,B9IV
647	8:26:21	-25:17	4.18	4.91	HD 170235	6.59	B2Vnne
648	8:26:25	-19:21	···	7.53	···	···	···
649	8:26:28	-21:41	7.25	7.54	HD 170299	8.80	B5IV/V
650	8:26:45	-33:10	···	6.53	Blend	6.81	A3III,B9IV/V
651	8:26:46	-20:59	···	7.73	HD 170364	7.40	A0V
652	8:26:51	-25:33	···	6.75	Blend	8.27	A1/A2IV,B8/B9III
653	8:27:20	-19:24	···	7.69	HD 170475	8.97	B8III/IV
654	8:27:21	-24:05	···	9.33	HD 170434	8.00	A1IV
655	8:27:24	-26:56	···	9.20	Blend	8.28	B9V,A2
656	8:27:26	-28:49	···	8.35	HD 170415	7.50	A1IV/V
657	8:27:32	-33:04	···	6.31	HD 170479	5.34	A5V
658	8:27:34	-21:48	7.47	7.77	HD 170497	8.10	B8II/III
659	8:28:02	-24:56	6.32	6.65	HD 170531	7.50	B4III
660	8:28:29	-26:15	···	9.85	CPD-26 6485	10.40	B8II
661	8:28:31	-18:26	5.02	4.94	HD 170680	5.14	B9/B9.5V
662	8:28:39	-19:08	···	6.34	IC 4725	7.18	···
663	8:28:41	-30:07	5.85	6.44	HD 170638	8.62	B3II/III
664	8:28:54	-32:39	···	7.51	SAO 210281	8.40	B9V
665	8:28:57	-29:09	7.84	8.33	SAO 186924	9.40	B7/B8Ib/
666	8:29:12	-27:16	6.23	6.67	HD 170770	7.76	B5IV
667	8:29:24	-19:15	6.60	···	IC 4725	7.61	···
668	8:29:26	-22:19	···	8.31	Blend	8.84	B8/B9III,A1III/IV
669	8:29:49	-25:07	···	8.72	HD 170907	8.80	B9III
670	8:30:07	-18:23	···	6.55	HD 171012	6.88	B0Ia/ab
671	8:30:08	-30:07	8.11	7.77	Blend	8.33	A0V,B9IV/V
672	8:30:12	-26:27	···	8.81	CPD-26 6496	10.90	B8Ib/II
673	8:30:16	-24:09	4.66	5.26	HD 170978	6.81	B3III/IV
674	8:30:18	-23:34	7.70	8.12	HD 170992	9.10	B7III
675	8:30:25	-33:07	···	3.14	HD 171034	5.28	B2IV-V
676	8:30:31	-20:25	7.29	7.50	Blend	7.69	B9III,B9IV:,B8/B9Ib
677	8:30:32	-21:16	···	8.82	HD 171078	9.10	Ap
678	8:30:36	-27:31	···	8.30	HD 171032	8.91	B8III
679	8:30:39	-22:41	···	8.67	HD 171096	10.00	B7Ib/II
680	8:31:02	-25:27	6.41	6.83	Blend	7.58	B9.5IV/V,B2II/III
681	8:31:09	-30:56	···	6.40	HD 171117	7.30	B9IV
682	8:31:16	-21:35	···	8.78	HD 171201	9.58	B0Ia
683	8:31:23	-22:15	6.39	7.09	Blend	8.40	B6II,B9
684	8:31:33	-25:15	···	7.68	HD 171225	9.80	B8IV/V
685	8:31:35	-22:35	···	8.18	HD 171254	8.70	A1V
686	8:31:47	-26:31	···	8.81	SAO 187001	9.80	B9V
687	8:32:13	-20:53	···	8.65	HD 171369	6.48	F0IV/V
688	8:32:21	-22:08	5.67	6.36	HD 171348	7.95	B2Vnne
689	8:32:21	-22:38	···	8.47	HD 171371	10.20	B5II/III
690	8:32:31	-19:27	7.98	8.17	HD 171414	9.60	B6II/III
691	8:32:34	-18:33	···	5.99	HD 171432	7.08	B1/B2Iab
692	8:32:46	-32:43	···	7.29	SAO 210358	8.90	B8/B9Ib
693	8:32:50	-30:53	···	8.00	SAO 210354	9.20	B8II
694	8:32:55	-23:07	···	8.87	Blend	9.89	A0V,B7IbII
695	8:33:12	-19:53	···	8.37	HD 171557	8.80	B6III
696	8:33:18	-26:45	···	8.85	SAO 187029	9.00	G8III
697	8:33:27	-18:48	···	7.38	HD 171590	8.30	A0/A1V
698	8:33:34	-25:22	7.78	8.09	HD 171561	8.50	B5III
699	8:33:41	-20:22	5.74	6.25	Blend	7.25	B3IV,B8IV/V
700	8:33:51	-19:11	···	7.62	HD 171690	8.40	B9III:
701	8:33:54	-19:49	···	8.19	HD 171709	9.30	B8III
702	8:33:55	-21:42	···	8.26	Blend	8.83	B8II/III,A4III,A5II/
703	8:34:06	-19:26	···	7.64	HD 171754	8.30	B5V
704	8:34:27	-23:39	···	6.58	HD 171737	9.30	B7II
705	8:34:36	-28:04	6.37	7.07	HD 171757	8.95	B3IIIe
706	8:34:50	-21:26	···	7.33	HD 171856	5.94	A5IV
707	8:34:57	-23:15	5.34	6.31	HD 171858	10.60	B7/B8II
708	8:35:12	-31:24	···	7.69	SAO 210386	9.10	B5V
709	8:35:23	-23:33	4.11	5.26	HD 171961	5.81	B8III
710	8:35:47	-30:36	···	6.75	HD 171963	7.60	B8/B9III
711	8:35:48	-32:04	···	7.69	CPD-32 5473	9.90	B7Ib/II
712	8:36:00	-32:34	···	7.71	SAO 210409	9.00	B8IV
713	8:36:04	-20:23	···	8.06	HD 172122	8.74	B3II
714	8:36:08	-28:16	8.18	8.02	HD 172054	7.50	B9.5IV
715	8:36:29	-22:02	7.38	7.80	HD 172158	7.90	B8II
716	8:36:44	-20:07	···	8.27	HD 172236	6.70	A8III
717	8:36:47	-29:25	···	7.44	HD 172140	9.94	B0.5III
718	8:36:48	-25:34	···	9.08	HD 172178	9.30	A1V
719	8:37:12	-22:44	6.22	6.88	HD 172256	8.72	B5II
720	8:37:31	-29:58	···	7.68	Blend	8.39	B9IV/V,B9.5IV

TABLE 4—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	Spectral Type
721	8:37:38	-21:34	6.89	7.56	HD 172370	8.80	B5III
722	8:37:57	-31:11	...	7.29	SAO 210457	8.80	B5V
723	8:38:13	-28:56	5.82	6.61	Blend	7.49	B5II/III,B9.5V
724	8:38:46	-23:54	...	7.84	HD 172546	6.23	A3m
725	8:38:46	-27:33	5.82	6.52	HD 172533	8.32	B5III
726	8:39:04	-23:13	...	8.10	Blend	8.6P	B8II,B7Ia,B7II
727	8:39:12	-29:42	...	7.41	SAO 187151	8.80	B8II
728	8:39:17	-20:21	...	7.25	HD 172696	7.10	Ap
729	8:39:31	-22:14	...	7.64	Blend	8.18	B5II/III,A0,A0IV/V
730	8:39:55	-27:45	...	7.45	SAO 187170	8.60	B8IV
731	8:40:14	-22:29	...	7.36	HD 172854	7.71	B3III
732	8:40:35	-23:19	...	8.95	HD 172906	9.30	B9III
733	8:41:48	-25:06	4.31	4.99	HD 173117	5.83	B8III
734	8:42:13	-28:18	...	6.92	Blend	7.72	B9IV,B8III
735	8:42:42	-28:54	...	7.09	Blend	7.47	B8/B9II,A0,A9
736	8:43:04	-27:04	...	2.72	HD 173300	3.20	B8III
737	8:43:46	-23:44	...	8.30	HD 173536	9.40	B8Ib
738	8:43:49	-22:24	...	7.38	HD 173570	8.80	B7III/IV
739	8:43:50	-22:41	...	7.62	HD 173571	8.80	B5III
740	8:43:54	-30:08	...	7.17	HD 173502	9.74	B1.5Ib
741	8:44:42	-28:27	...	7.60	HD 173657	7.30	B9

[a] Object 612. Although the A star is about ten magnitudes fainter in V than the K star, it may contribute a comparable amount to the ultraviolet flux.

NOTE.—Table 4 also appears in machine-readable form in the AAS CD-ROM Series, Vol. 4.

brighter than m_{1781}. Since a similar effect is not seen in the comparison with the *ANS* magnitudes, we conclude that it is caused by a departure from linearity in the *TD-1* scale at the faint end. On the other hand, all three previous data sets tend to have brighter magnitudes at the bright end. We attribute this to uncertainties in our saturation correction.

Figure 4 compares m_{1375} with magnitudes from *OAO 2* and S201. While the *OAO 2* bands bracket the present λ1375 band, the C magnitude from S201 approximates it closely. The S201 L band extends to a shorter wavelength and includes the Lyα line of hydrogen.

Figures 4*a* and 4*b* show a linear relationship between our magnitude and the *OAO 2* magnitudes for stars fainter than $m_{1375} = 1$. The zero points are in close agreement (mean differences of 0.23 and 0.14 mag with rms scatter of 0.22 and 0.15 mag for m_{1330} and m_{1430}, respectively, omitting the four brightest stars). The S201 C magnitudes (Fig. 4*c*) are fainter than ours by 0.50 (omitting four deviant points) with an rms scatter of 0.37. There is also a suggestion of a scale difference in that the points in Figure 4*c* seem to have a slope greater than unity; a least squares fit yields a slope of 1.113. The S201 L magnitudes (Fig. 4*d*) are also fainter than ours on the average. However, there is more scatter and a significant number of the *S201 L* magnitudes are anomalously bright. This may be caused by contamination by Lyman-α.

The sizable systematic difference between our magnitudes and the S201 magnitudes indicates a difference between the S201 calibration and the *IUE* intensity scale which was used to calibrate the present photometry. This will be further discussed in another paper using the pre- and post-flight calibrations. For the present, we will assume that the *IUE* calibration is to be preferred.

The scatter in the comparison of previous data with our photometry is the smallest for the *OAO 2* magnitudes. Ignoring errors in the latter gives an upper limit for the internal errors of our magnitudes of between 0.15 and 0.29 mag. Since the S201 magnitudes and the present magnitudes were obtained with similar cameras and analyzed in a similar fashion, we might expect similar internal errors in the two data sets. Under this assumption, the internal standard deviation of the present photometry is $\sigma = 0.37/\sqrt{2} = 0.26$ mag. We can obtain another upper limit on the errors by noting that the color $(m_{1375} - m_{1781})$ is relatively insensitive to temperature (as shown in Fig. 1) and to interstellar absorption. The rms scatter of $(m_{1375} - m_{1781})$ is 0.38. Assuming this is dominated by random errors in the magnitudes, the corresponding internal errors in the individual magnitudes are $\sigma = 0.38/\sqrt{2} = 0.27$ mag. These estimates agree well with what we found from the *IUE* spectra above. We will adopt 0.25 mag as a preliminary estimate of the internal uncertainty of our ultraviolet photometry.

There is another set of images which covers the Galactic center and overlaps the fields being studied here. When reduced they will provide another check on both the internal errors and the absolute calibration of our data.

5. DISCUSSION

For the following discussion we have selected only the ultraviolet objects for which data from SIMBAD can be used. This requires that the object be identified with a unique star. Further, that star must have a spectral type and subtype and a V magnitude. The existing data for these fields (which have both been covered by the Michigan Spectral Survey; Houk 1978, 1982; Houk & Smith-Moore 1988) is extensive and our selected sample contains 727 stars (or 57% of the total). In fact, MK spectral types exist for most of the selected sample.

Figure 5 presents histograms of the ultraviolet magnitudes of all the objects in Tables 4 and 5. The sudden drop in the distributions at the faint end indicates limiting magnitudes between 8.5 and 9.0 in the M8 field but about 8.0 for the ζ Sco images. The different limits for the two fields are consistent with the exposure times. For both fields the distributions begin to flatten out fainter than about seventh magnitude. This probably reflects incompleteness in our sample due to crowding.

In Figure 6 we plot a histogram of the spectral types of the stars in the selected sample. We have not included ten Ap stars, two WC stars and one star of each of the types WNn, DA, Am, Asp and O/Be. As was the case in Monoceros and Orion (Papers I and II), the most common type of star is near spectral type A0. However, there are many more early B stars than in the previous studies; stars earlier than B6 make up 50% of the stars in the ζ Sco field and 40% of those in the M8 field but only 12% and 20% of the Monoceros and Orion samples. The presence of a number of OB associations in these fields (Ara OB1 and Sco OB1 in the ζ Sco field and Sgr OB1, Sgr OB4, Sgr OB7, and portions of Sgr OB6 and Ser OB1 in the M8 field) might account for this. On the other hand, stars with spectral types of F0 and later comprise only 1% of the present objects while they were 21% and 6% of the Monoceros and Orion samples.

TABLE 5

Ultraviolet Ojects in the ζ Scorpii Field

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	Spectral Type
1	5:57:51	-40:17	...	5.98	HD 143248	6.21	A0V
2	5:59:43	-43:17	...	6.82	Blend	7.29	B9V,A0V
3	6:01:08	-40:42	...	7.70	HD 143824	7.70	A1V
4	6:01:36	-37:40	...	5.53	Blend	7.13	B8/B9V,A1V
5	6:01:37	-39:18	...	6.08	HD 143939	7.10	B9p
6	6:02:41	-39:41	...	8.12	Blend	7.78	A5,B6IV/V
7	6:03:07	-45:01	...	6.38	HD 144197	4.72	Am
8	6:03:15	-36:39	...	2.04	HD 144294	4.20	B2.5Vn
9	6:03:25	-39:06	...	9.62	SAO 207329	8.00	A1V
10	6:04:03	-43:09	...	8.39	HD 144351	7.10	A1V
11	6:04:51	-43:42	...	8.32	HD 144478	7.90	B9V
12	6:04:51	-44:43	...	7.95	Blend	9.29	B7III/IV,A2
13	6:04:55	-36:06	...	5.31	HD 144591	6.90	B9V
14	6:05:19	-38:58	...	5.20	Blend	6.08	A1.5III,A7IVe
15	6:06:02	-44:50	...	7.67	GC 21695	9.8	B9II
16	6:06:27	-44:41	...	7.30	HD 144851	8.73	B8V
17	6:06:50	-40:00	5.55	6.24	HD 144965	7.06	B3Vne
18	6:06:56	-42:41	...	7.92	Blend	7.60	B9V,B9V,A2,A0V
19	6:08:01	-41:00	...	7.89	HD 145191	5.86	F0IV
20	6:10:50	-43:36	7.01	...	Blend	9.31	B9II/III,B9
21	6:11:35	-47:14	...	3.74	HD 145842	5.14	B8V
22	6:11:35	-39:30	6.51	6.42	Blend	6.88	B9.5V,A3V
23	6:14:09	-42:54	7.59	8.10	HD 146335	8.20	B6III
24	6:14:59	-45:44	...	8.08	Blend	8.9P	B2III,B8
25	6:15:54	-42:35	...	6.37	HD 146667	5.45	A3Vn
26	6:16:32	-43:14	7.64	7.84	Blend	7.49	B8V,A0V,A1V
27	6:16:39	-46:14	...	7.47	Blend	7.7P	A0V,B9III/IV,B9
28	6:17:05	-39:19	4.41	4.88	Blend	5.78	B9V,B9V
29	6:17:47	-47:00	...	7.83	Blend	7.70	A0IV,B3III
30	6:17:47	-48:03	...	5.32	HD 147001	6.52	B7V
31	6:18:41	-43:05	7.17	7.61	HD 147181	7.62	B9Vn
32	6:20:07	-39:07	6.38	7.26	CP-38 10980	10.98	DA [a]
33	6:20:45	-33:07	...	5.94	Blend	5.71	?,?,A0V+
34	6:21:06	-45:04	6.79	6.80	HD 147556	7.7	B8/B9II
35	6:21:09	-37:27	3.34	4.06	HD 147628	5.42	B8IV
36	6:21:19	-34:48	...	6.07	HD 147683	6.98	B4V
37	6:21:24	-45:15	...	6.73	HD 147614	6.33	A2.5V
38	6:22:09	-45:26	6.50	7.05	HD 147756	8.63	B2V:ne
39	6:23:05	-47:56	4.92	5.61	HD 147894	7.18	B5III
40	6:23:14	-47:28	2.14	3.00	HD 147971	4.47	B4V
41	6:23:23	-43:42	5.71	6.29	Blend	7.36	B1/B2II,B9II
42	6:24:15	-43:55	6.62	7.10	HD 148122	8.09	B4II/III
43	6:25:02	-46:55	6.77	6.70	Blend	7.9P	B8V,B8,B8
44	6:25:15	-44:43	5.27	5.91	HD 148259	7.42	B2II
45	6:25:23	-44:56	...	6.67	HD 148260	7.93	B1Ib
46	6:26:02	-46:09	6.10	6.21	HD 148379	5.35	B2Iab
47	6:26:09	-41:00	6.00	6.27	Blend	6.78	A0V,B9IV
48	6:26:15	-47:26	...	7.08	Blend	9.2P	B5III,A0
49	6:26:56	-37:52	6.30	6.70	HD 148546	7.73	B0Ia
50	6:27:25	-46:23	6.50	6.84	Blend	7.58	B2II:ne,?
51	6:27:31	-34:33	...	2.63	...	...	...
52	6:27:43	-49:01	5.62	6.27	HD 148610	8.22	B2/B3IV
53	6:28:04	-34:36	0.92	3.53	HD 148703	4.23	B2III-IV
54	6:28:08	-41:43	4.68	5.08	HD 148688	5.33	B1Ia
55	6:29:18	-46:11	7.16	8.06	HD 148826	9.10	B4/B5IV
56	6:29:34	-48:20	6.10	6.44	HD 148851	8.72	B5IV
57	6:29:39	-33:25	...	7.07	HD 148950	7.50	A0V
58	6:29:59	-46:35	6.42	7.04	Blend	8.2P	B6V,A
59	6:30:11	-48:00	5.32	5.46	HD 148937	6.73	O6e
60	6:30:13	-48:13	...	6.14	Blend	8.93	B8/B9III,A0V
61	6:30:27	-47:31	...	7.80	CD-47 10858	8.40	B9V
62	6:30:30	-43:57	2.49	3.38	NGC 6169 1	4.94	B0Ia
63	6:30:58	-49:12	...	7.93	Blend	7.17	B9Ib,B5IV
64	6:31:05	-46:36	...	7.25	Blend	8.5P	B8III,A0,A,A2
65	6:31:12	-47:54	...	6.24	HD 149098	7.80	B9IV
66	6:31:36	-44:47	7.48	...	HD 149204	9.30	B7III
67	6:31:40	-34:06	7.31	6.57	HD 149255	8.78	B8II
68	6:31:41	-49:06	...	7.88	Blend	8.47	B8V,B2II:,B9V
69	6:31:46	-43:34	6.27	6.62	HD 149231	8.34	B3V
70	6:31:48	-34:18	6.07	6.48	HD 149273	9.29	B0.5V
71	6:31:49	-35:37	5.29	5.57	HD 149274	6.80	B9V
72	6:32:12	-45:33	4.70	5.48	NGC 6178	7.28	...
73	6:32:19	-46:23	6.98	7.54	CD-46 10864	9.50	B5V
74	6:32:28	-43:07	...	7.88	Blend	7.67	A0V,A0
75	6:32:44	-46:45	...	9.02	Blend	8.97	B,B2III,B7Ib/II
76	6:32:47	-42:46	4.71	5.03	HD 149404	5.47	O9Iab/Ib
77	6:32:49	-46:09	5.79	6.64	HD 149370	8.80	B3III
78	6:32:50	-34:05	...	7.71	HD 149439	8.00	A3V
79	6:32:59	-40:12	6.04	6.48	HD 149425	7.00	B9V
80	6:33:26	-45:14	5.14	5.93	Blend	7.79	B3III,B9IV
81	6:33:28	-37:01	7.62	7.46	SAO 207829	7.90	B8/B9III
82	6:33:33	-38:34	6.22	6.43	SAO 207834	7.40	B9V
83	6:34:15	-45:47	6.90	...	HD 149587	8.50	B4III
84	6:34:15	-47:13	6.57	7.20	Blend	8.94	B6Vn,B2/B3III
85	6:34:17	-48:52	...	6.80	HD 149589	9.39	B2IV
86	6:34:31	-48:07	6.70	7.01	Blend	8.67	B5V,B3IV
87	6:34:52	-43:18	3.25	3.91	HD 149711	5.83	B2.5IV
88	6:34:55	-39:32	7.24	7.12	SAO 207862	7.90	A0V
89	6:34:57	-48:42	...	5.85	Blend	8.0P	B9IV/V,B3IV,A0,B2IV,
90	6:35:00	-39:03	5.72	5.96	HD 149764	6.96	A0
91	6:35:22	-44:04	5.76	6.25	HD 149779	7.49	B2IV
92	6:35:23	-31:52	...	7.30	Blend	8.41	B3V,B5IV
93	6:35:37	-37:07	5.22	5.27	HD 149886	5.91	B9.5V+
94	6:35:43	-44:48	7.12	7.26	HD 149831	8.48	Ap
95	6:35:50	-46:49	...	8.01	CD-46 10905	9.70	B4III
96	6:36:09	-45:04	7.35	7.48	HD 149899	8.20	B8II/III
97	6:36:09	-49:03	...	6.79	Blend	8.4P	B7/B8V,A0,B2V
98	6:36:26	-39:41	6.98	7.36	HD 150004	7.70	B9.5V
99	6:36:39	-49:14	...	6.15	Blend	8.49	B1/B2III,B5V
100	6:36:39	-36:22	6.72	7.19	HD 150069	8.28	B5III
101	6:36:43	-48:39	...	4.06	NGC 6193	4.42	...
102	6:36:55	-37:32	7.40	7.60	SAO 207904	8.20	B9III
103	6:37:11	-41:02	6.64	6.93	HD 150093	7.91	B4II/III
104	6:37:12	-35:35	5.77	6.13	HD 150151	6.64	B5III
105	6:37:17	-37:03	7.36	6.93	HD 150164	7.30	A0V
106	6:37:25	-47:39	5.56	6.03	Blend	6.82	B5III,Ap
107	6:37:34	-48:39	2.58	3.39	NGC 6193	5.15	O5,O6:,B1/B2Ib
108	6:37:48	-46:18	7.13	7.31	Blend	7.9P	B9IV,A0,B8/B9III
109	6:37:52	-49:34	3.11	4.11	HD 150168	5.65	B1Ia0-a.
110	6:37:59	-47:57	...	7.38	Blend	8.53	B9Ib/II,B3II/III
111	6:38:17	-47:17	6.49	7.06	Blend	8.60	B8,A0III
112	6:38:24	-32:42	7.21	6.94	Blend	7.26	Asp,A5III
113	6:38:42	-46:55	6.41	6.43	HD 150288	8.66	B3V
114	6:39:20	-37:46	6.82	6.94	HD 150475	8.73	B0/B0.5I
115	6:39:25	-32:10	...	6.93	SAO 207945	8.60	B9V
116	6:39:28	-40:32	6.54	6.23	HD 150456	8.00	B2III:
117	6:39:30	-48:11	7.27	7.65	Blend	8.50	B2III,B3II/III
118	6:39:33	-38:34	...	7.59	SAO 207953	7.69	B9
119	6:39:35	-32:34	...	7.36	Blend	8.59	B9V,A4III:
120	6:39:36	-46:25	...	8.00	HD 150422	8.94	B1/B2ne
121	6:39:54	-46:45	...	7.02	Blend	8.79	B9V,A5,B9,B3IV
122	6:40:06	-48:24	...	7.20	Blend	7.91	B9IV/V,B8/B9IV
123	6:40:11	-47:01	5.20	5.56	Blend	6.75	B9p,B7Ib/II,A0/A1V
124	6:40:20	-38:03	4.54	4.87	HD 150608	6.05	B9II-III
125	6:40:21	-41:01	3.79	4.14	Blend	5.41	B6.5V,A4V
126	6:40:23	-32:00	4.27	4.85	HD 150638	6.48	B8V
127	6:40:29	-47:22	...	6.73	Blend	6.80	...
128	6:40:35	-46:03	6.88	7.00	HD 150574	8.51	O8/O9
129	6:40:36	-40:20	7.04	...	CD-40 10656	9.00	B3II/III
130	6:41:10	-40:44	2.97	3.56	HD 150742	5.71	B3V
131	6:42:18	-32:24	...	7.59	Blend	7.94	A0V,A1V
132	6:42:32	-46:27	...	6.50	HD 150897	6.47	A2V

TABLE 5—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	Spectral Type
133	6:42:34	-49:00	...	8.18	Blend	8.84	B8V,?
134	6:43:01	-47:00	6.17	6.16	NGC 6204	5.88	...
135	6:43:04	-41:31	4.96	5.46	HD 151003	7.06	O9Iab/Ib
136	6:43:27	-32:50	...	8.33	CPD-32 4239	7.90	A0IV
137	6:43:33	-39:26	5.28	5.66	Blend	6.75	B8V,A1V
138	6:43:37	-41:10	6.18	...	Blend	8.08	B3III,B3III,B1.5V
139	6:43:53	-41:43	6.44	6.34	HD 151139	7.56	B2Ib/II
140	6:44:02	-45:22	4.61	5.15	Blend	6.64	B4II/III,B5II/III
141	6:44:05	-42:47	6.75	7.14	HD 151158	8.22	B2Ib/II
142	6:44:22	-41:03	6.20	6.72	Blend	8.4P	B1/B2Ib,B8,B9,B3
143	6:44:39	-36:47	...	8.41	Blend	7.08	A5IV/V,A
144	6:44:41	-47:11	5.97	6.28	Blend	8.83	O7e,B1III
145	6:45:03	-46:16	...	8.17	Blend	8.3P	B9IV,A3
146	6:45:16	-48:13	6.02	6.53	HD 151318	8.29	B3IV
147	6:45:23	-39:41	7.56	7.84	HD 151397	9.78	B0.5V
148	6:45:28	-31:05	...	4.83	HD 151395	6.81	B4V
149	6:45:36	-49:54	7.29	6.93	HD 151363	7.60	Ap
150	6:45:38	-47:36	...	8.24	CD-47 11069	9.50	B9Ib/II
151	6:45:59	-32:39	...	8.51	SAO 208063	9.00	B9III/IV
152	6:46:01	-43:52	7.19	7.23	HD 151473	7.47	A0IV/V
153	6:46:14	-47:03	5.94	6.36	Blend	7.83	B3II/III,O
154	6:46:19	-41:55	4.86	5.29	HD 151515	7.16	O7II
155	6:46:34	-41:32	5.50	5.77	HD 151564	8.01	B0III
156	6:46:37	-49:12	...	7.85	Blend	7.78	A0V,B9V
157	6:47:30	-43:37	6.50	7.04	Blend	7.94	B5/B6II,B7II
158	6:47:33	-46:51	7.26	7.32	Blend	7.67	B9III,B9,B9,B9+,B9V
159	6:47:37	-37:26	4.46	...	HD 151771	6.11	B8II/III
160	6:48:05	-41:08	3.12	3.54	HD 151804	5.22	O8Iab:p
161	6:48:09	-41:41	5.04	...	HD 151805	8.86	B1Ib
162	6:48:36	-37:57	-0.22	0.89	Blend	2.51	B1.5Vp+,B2IV
163	6:48:46	-32:57	...	8.15	SAO 208113	9.80	B8IV
164	6:48:53	-41:45	4.55	...	Blend	5.98	WNs,O
165	6:48:59	-40:38	4.41	4.54	Blend	6.14	B9p,A1V
166	6:48:59	-48:43	...	7.74	Blend	8.88	B3III,B5II
167	6:49:05	-42:55	7.14	7.09	HD 151966	6.70	A0V
168	6:49:28	-47:09	6.61	6.88	HD 151988	7.40	B8V
169	6:49:30	-47:30	7.26	7.44	HD 152004	9.20	B3IVne
170	6:49:32	-41:28	5.14	...	Blend	7.16	Six B stars
171	6:49:46	-43:40	7.45	7.75	HD 152077	9.04	B2Iab/Ib
172	6:49:49	-31:47	6.22	6.54	Blend	7.19	B4III,A9V
173	6:49:52	-33:11	...	7.26	HD 152158	7.66	A1IV
174	6:49:53	-45:23	6.34	7.02	HD 152078	8.16	B3III
175	6:50:00	-44:26	7.48	...	Blend	9.3P	A0,B2II
176	6:50:07	-31:19	...	7.66	HD 152179	8.87	B2IV
177	6:50:08	-42:00	5.00	...	Blend	5.94	O,B0Ia
178	6:50:23	-41:13	4.86	...	Blend	7.04	Seven B stars
179	6:50:23	-46:50	6.60	6.76	Blend	7.26	B3/B4III,A1V
180	6:50:24	-45:57	6.14	6.70	Blend	7.87	B2III,B9V
181	6:50:32	-42:16	5.36	5.34	HD 152236	4.73	B1Iape
182	6:50:41	-40:27	4.43	4.71	Blend	7.43	Four B stars
183	6:50:43	-41:44	2.25	...	NGC 6231	2.60	...
184	6:50:51	-40:56	3.72	...	Blend	...	...
185	6:51:03	-33:23	7.33	6.47	Blend	6.85	A0V,A2
186	6:51:08	-38:28	4.99	...	Blend	8.63	B7III,A3IV
187	6:51:10	-41:20	4.83	...	Blend	7.07	Six B stars
188	6:51:12	-47:17	...	8.43	Blend	8.45	B8/B9V,A4m
189	6:51:16	-40:49	4.08	...	Blend	...	...
190	6:51:26	-40:39	4.19	...	Co. 316	3.40	...
191	6:51:26	-48:43	6.37	6.63	Blend	7.22	B9IV,B2III/IV
192	6:51:28	-47:49	7.06	7.52	Blend	8.31	B8V,B9IV/V
193	6:51:31	-40:26	4.18	...	HD 152405	7.20	B0Ia
194	6:51:34	-41:03	3.70	...	HD 152408	5.77	WNn
195	6:51:35	-42:00	4.95	4.82	HD 152424	6.31	B0Ib/II
196	6:51:40	-38:19	4.90	...	HD 152456	7.23	B8/B9III
197	6:52:00	-45:15	6.66	7.06	HD 152438	8.22	B6III
198	6:52:03	-39:22	5.70	6.00	NGC 6242	...	...
199	6:52:07	-43:14	6.79	6.24	HD 152491	6.77	A1V
200	6:52:24	-48:57	7.58	7.63	HD 152505	8.88	B2/B3Vne
201	6:52:25	-43:00	6.46	6.70	Blend	8.4P	B9II/III,B8
202	6:52:25	-31:19	...	5.52	Blend	6.36	A0/A1V,B7II
203	6:52:27	-50:38	3.83	...	HD 152478	6.33	B3Vnpe
204	6:52:30	-40:56	4.42	...	Blend	7.10	A5m,B2V:n,A3IIIm
205	6:52:40	-42:31	...	7.42	Blend	8.1P	B9,A0,B5
206	6:52:40	-46:46	6.42	6.60	HD 152541	7.45	B7V
207	6:52:41	-40:16	4.55	...	Blend	7.56	B1/B2Ib,O7.5V
208	6:52:50	-40:35	3.35	...	Blend	6.31	O8:,B2II,O9.5III
209	6:53:16	-42:16	6.26	6.52	Blend	7.6P	Seven B and early A
210	6:53:17	-41:04	5.30	5.47	HD 152685	7.46	B1Ib
211	6:53:21	-40:26	3.41	...	Blend	6.65	O7/O8,B1/B2Ib,B3,B5,B
212	6:53:34	-32:19	7.74	6.99	Blend	7.20	A3V,B9.5/A0V,B4IV
213	6:53:35	-31:54	7.61	8.33	SAO 208227	8.60	B7III/IV
214	6:53:35	-40:51	4.67	4.81	Blend	5.98	B9.5Iae,B4II/III
215	6:53:37	-42:52	6.81	6.87	HD 152742	9.13	B4II/III
216	6:54:27	-37:55	5.23	5.69	HD 152901	7.45	B2.5Vn
217	6:54:30	-45:54	4.81	5.35	NGC 6250	7.28	...
218	6:54:34	-50:36	5.06	...	HD 152824	5.55	B9IV
219	6:54:34	-34:19	...	7.94	Blend	8.78	B5III/IV,A0
220	6:54:50	-40:59	6.62	6.43	HD 152940	8.00	B8Ib
221	6:55:11	-49:40	7.46	7.47	HD 152946	7.70	B8/B9V
222	6:55:17	-48:46	...	8.29	HD 152966	6.80	A5IIIs
223	6:55:23	-46:03	5.46	5.72	SAO 227517	8.19	B2IV
224	6:55:27	-37:32	...	6.88	Blend	5.5P	A3V,A2V,A4V
225	6:55:42	-38:29	5.85	6.31	HD 153102	7.59	B5Vnn
226	6:55:51	-41:19	...	7.23	CD-41 11140	8.20	B7III
227	6:55:53	-45:49	6.31	6.08	SAO 227526	9.10	B2III
228	6:56:02	-32:50	7.24	7.54	SAO 208275	8.80	B7IV/V
229	6:56:10	-46:23	4.54	5.17	Blend	6.89	B1II,B2IV/V
230	6:56:13	-33:40	4.88	...	SAO 208271	9.20	B8/B9IV
231	6:56:31	-43:09	6.53	6.95	HD 153199	8.12	B3II/III
232	6:56:34	-49:09	...	7.58	Blend	8.7P	B1IIe,B5
233	6:56:36	-31:37	6.50	6.56	HD 153294	8.28	B7Ib/II
234	6:56:39	-48:55	...	7.95	CD-48 11361	9.6	B
235	6:57:06	-37:36	8.02	8.68	SAO 208289	9.80	B4III:
236	6:57:16	-35:40	...	8.19	HD 153367	8.89	B8
237	6:57:42	-42:00	6.27	6.52	HD 153382	7.33	B8II
238	6:57:49	-38:07	5.10	5.52	Blend	6.87	B9II/III,A0V
239	6:58:06	-37:56	5.95	6.14	SAO 208310	9.30	B4II/III
240	6:58:26	-33:17	...	8.71	HD 153574	7.18	A3III
241	6:58:31	-48:50	...	8.26	CPD-48 8968	8.50	B7V
242	6:58:31	-37:14	7.41	7.92	HD 153575	7.73	B0III/IV
243	6:58:31	-41:07	6.70	6.92	HD 153519	8.40	B6II/III
244	6:58:35	-32:04	3.22	3.47	HD 153613	5.03	B8V
245	6:58:49	-50:04	...	7.40	HD 153579	6.90	A0V
246	6:59:23	-40:50	6.35	6.68	HD 153677	7.16	B2/B3II
247	6:59:28	-38:23	...	7.58	SAO 208337	7.50	A0III
248	6:59:31	-36:47	5.74	6.10	HD 153766	7.95	B1IV
249	6:59:36	-45:20	7.19	7.32	CD-45 11161	8.60	B8V
250	6:59:37	-35:43	...	8.55	HD 153804	8.54	B5Vn
251	6:59:41	-37:39	5.94	5.57	HD 153767	7.43	A0V
252	6:59:51	-32:48	6.79	6.74	HD 153839	8.24	B7II
253	7:00:01	-31:32	3.65	4.26	HD 153855	6.97	B1III
254	7:00:05	-47:04	...	6.17	HD 153791	6.06	A2.5V
255	7:00:07	-34:42	...	7.97	SAO 208349	9.80	B6II
256	7:00:16	-37:06	6.07	6.67	SAO 208351	8.50	B2.5II
257	7:00:18	-49:14	...	8.43	Blend	8.7P	Ap,A3,B9IV/V
258	7:00:25	-37:45	4.78	4.89	NGC 6281	6.40	O6,B8
259	7:00:25	-47:22	6.41	6.77	HD 153827	8.64	B3III/IV
260	7:00:29	-44:05	7.35	7.40	Blend	7.4P	Five B
261	7:00:43	-49:59	...	8.13	HD 153908	7.80	B9V
262	7:00:48	-38:03	...	6.35	NGC 6281	...	...
263	7:01:26	-46:54	6.00	6.09	Blend	6.55	O,B7/B8V
264	7:01:29	-34:04	4.28	4.35	HD 154090	4.87	B1Iae

TABLE 5—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	Spectral Type
265	7:01:34	-45:25	⋯	6.45	HD 154025	6.28	A2V
266	7:01:36	-38:32	⋯	7.93	Blend	0.00	B9IV/V,A0
267	7:01:43	-46:05	⋯	7.92	Blend	8.8P	B2II,A0,B9III/IV
268	7:02:05	-48:56	⋯	8.96	Blend	8.8P	B8II,A0
269	7:02:17	-48:21	5.81	6.28	Blend	7.96	B2Vnne,B6III
270	7:02:20	-36:40	5.70	5.98	Blend	6.83	B3Vne,B3Vnne
271	7:02:21	-44:02	⋯	7.35	HD 154153	6.19	A4III
272	7:02:22	-44:19	6.37	6.28	Blend	7.34	B9V,A0IV/V
273	7:02:22	-35:51	⋯	7.02	Blend	8.21	B5,B8
274	7:02:28	-34:54	6.46	6.81	Blend	7.95	B3III,B2/B3III,B4/B5
275	7:02:41	-42:51	7.89	7.55	CD-42 11823	9.60	B7/B8Ib/
276	7:02:58	-34:34	⋯	7.13	Blend	8.08	B5V,A0IV/V,B9II,B4II
277	7:02:58	-37:10	7.33	6.40	HD 154310	5.98	A2IV
278	7:02:58	-44:30	6.12	6.14	HD 154247	8.21	B6IV
279	7:03:06	-35:24	6.65	6.25	HD 154368	6.13	O9Ia
280	7:03:18	-38:10	8.04	⋯	SAO 208412	9.40	B5III
281	7:03:19	-36:01	6.30	6.40	HD 154385	7.38	B0.5Iab.
282	7:03:25	-35:50	6.09	6.23	HD 154407	8.14	B2Vn
283	7:03:26	-46:56	7.06	7.81	HD 154339	8.29	B3II/III
284	7:03:34	-38:21	7.49	7.51	SAO 208421	8.60	B5III
285	7:03:41	-35:43	⋯	6.49	HD 154450	7.94	Be
286	7:03:49	-48:30	6.52	6.88	HD 154388	8.68	B2IV
287	7:03:52	-44:22	6.07	6.11	HD 154410	7.50	A0V
288	7:03:58	-46:36	⋯	8.95	HD 154426	6.89	A7III
289	7:04:09	-35:08	⋯	7.61	SAO 208437	8.10	B5III
290	7:04:10	-34:28	5.63	6.24	Blend	8.11	B2IV,B2Iab
291	7:04:17	-42:41	6.43	6.50	Blend	7.60	B7III,Ap
292	7:04:39	-49:24	6.65	7.09	Blend	7.74	B3V,B5
293	7:04:41	-41:32	⋯	8.01	HD 154569	6.90	A5IV
294	7:04:46	-44:36	7.77	⋯	HD 154551	9.40	B7/B8III
295	7:04:52	-34:57	5.99	6.16	HD 154643	7.15	B0Ib
296	7:05:01	-33:49	6.09	6.49	HD 154664	8.73	B2V
297	7:05:50	-47:11	6.44	6.50	HD 154744	7.74	B8V
298	7:06:02	-37:11	⋯	7.72	HD 154834	9.78	B3II
299	7:06:03	-33:27	⋯	8.26	Blend	8.57	B8III/IV,B9III/IV
300	7:06:14	-46:58	5.95	6.16	HD 154811	6.93	B0II/III
301	7:06:18	-40:09	⋯	8.04	HD 154836	8.00	B9IV/Vn.
302	7:06:40	-38:33	⋯	8.40	HD 154911	9.06	B0
303	7:06:42	-46:40	5.45	5.80	HD 154873	6.70	B1Ib
304	7:06:48	-40:59	7.04	7.36	HD 154899	8.56	B5III
305	7:07:09	-48:17	⋯	8.39	Blend	8.94	B4IV/V,B9II
306	7:07:10	-48:41	⋯	8.05	Blend	8.6P	B8II,A,B8II
307	7:07:12	-32:34	⋯	7.31	Blend	8.48	B8/B9II,B9.5III
308	7:07:15	-50:03	6.17	6.27	Blend	6.99	B8V,Ap
309	7:07:26	-36:22	6.65	7.09	SAO 208497	8.50	B4II/III
310	7:07:40	-41:23	7.56	7.18	HD 155031	7.80	A0V
311	7:07:43	-41:38	7.01	7.11	Blend	7.53	B1Ib,B1/B2II
312	7:07:43	-46:07	5.81	6.28	HD 155020	7.52	B2IV
313	7:07:46	-44:02	6.65	7.26	HD 155032	9.31	B2II/III
314	7:07:55	-49:37	⋯	8.66	Blend	8.4P	B9IV,A2,A5
315	7:08:16	-32:11	5.52	5.68	HD 155217	8.65	B1V
316	7:08:44	-43:10	⋯	6.90	Blend	3.33	F3III-IV,A1V [b]
317	7:08:45	-49:01	6.17	6.58	Blend	8.07	B3/B4III,B7Ib/II
318	7:08:47	-33:35	5.49	5.44	SAO 208519	8.90	B3IV
319	7:08:53	-39:27	6.11	5.41	HD 155259	5.67	A1V
320	7:08:59	-34:20	5.93	6.30	HD 155320	8.35	B0.5V
321	7:09:13	-46:22	⋯	8.08	HD 155280	8.72	B2/B3II
322	7:09:26	-33:39	5.35	5.42	HD 155403	8.20	B2V
323	7:09:36	-42:34	6.03	6.72	HD 155352	8.20	B2V
324	7:09:38	-48:22	7.14	7.41	HD 155354	8.30	B8II
325	7:09:38	-33:19	3.91	4.24	HD 155402	7.77	B2II
326	7:09:41	-32:24	3.69	4.09	HD 155450	6.01	B1II
327	7:09:45	-32:17	4.07	4.00	Blend	8.28	B9,B9
328	7:09:47	-37:53	⋯	7.61	HD 155416	6.61	B7II
329	7:09:51	-47:15	6.64	6.46	HD 155389	7.11	A0V
330	7:10:25	-32:50	5.93	6.24	HD 155550	8.01	B6V
331	7:10:35	-49:08	⋯	8.05	Blend	7.7P	A0IV,A0
332	7:10:50	-33:13	4.71	⋯	Blend	7.25	B1V,B2Vnn,B7Vn
333	7:11:45	-32:48	5.83	⋯	Blend	9.03	B5V,B5IV
334	7:11:47	-33:44	3.30	⋯	Blend	7.49	B1V,B7V,B3III,B5V
335	7:11:57	-33:31	2.39	2.77	HD 155806	5.53	O8Ve
336	7:11:59	-33:12	6.09	4.34	Blend	7.91	B7IV,B8V,B5IV
337	7:12:00	-38:10	3.82	4.45	HD 155775	6.72	B1III
338	7:12:13	-32:40	5.35	6.09	Blend	7.94	B0Vn,B5
339	7:12:17	-46:16	7.62	7.72	HD 155778	7.77	Ap
340	7:12:28	-33:42	2.98	2.93	Blend	6.40	O9V,B3V
341	7:12:28	-32:02	⋯	6.61	Blend	7.93	B6V,B2V
342	7:12:29	-34:01	6.20	4.47	Blend	9.06	B5V,B9IV:
343	7:12:49	-38:18	4.78	⋯	Blend	8.23	B7V,O
344	7:12:53	-42:17	4.86	5.30	HD 155896	6.75	B2/B3V:n
345	7:13:02	-42:35	⋯	7.03	HD 155913	8.25	O5/O6
346	7:13:15	-32:20	4.85	5.29	HD 156004	7.82	B4III
347	7:13:35	-44:43	4.96	5.32	HD 155985	6.46	B0Ib
348	7:13:59	-35:30	⋯	7.27	Blend	6.42	?,B0Iab,O,B0V
349	7:14:06	-49:24	5.00	5.33	HD 156070	7.54	B2II/III
350	7:14:15	-45:13	7.67	7.80	HD 156085	9.18	B2II
351	7:14:19	-32:11	⋯	5.27	HD 156187	9.21	B3V
352	7:14:25	-35:12	⋯	8.36	HD 156201	7.88	B0.5Ia
353	7:14:30	-46:02	8.16	7.56	Blend	8.62	B6II,B8
354	7:14:33	-43:31	5.27	5.57	HD 156157	7.02	B8V
355	7:14:33	-42:00	7.70	7.47	Blend	8.3P	O9Ia/Iab,B5
356	7:14:35	-50:12	6.10	⋯	HD 156123	7.00	A0V
357	7:14:38	-47:46	6.50	6.61	HD 156173	7.90	B9V
358	7:14:39	-34:12	5.71	5.87	HD 156256	8.24	B3V
359	7:14:44	-38:07	6.56	6.38	HD 156232	7.00	A0IV
360	7:14:46	-33:13	6.87	6.63	HD 156269	9.44	B2III
361	7:15:02	-32:32	4.81	4.65	HD 156325	6.38	B5Vne
362	7:15:09	-32:21	4.27	4.47	Blend	7.31	B2V,B2V,B2V
363	7:15:10	-48:39	6.70	6.89	HD 156275	7.87	B9III/IV
364	7:15:11	-42:52	5.36	5.59	Blend	5.38	B stars in NGC 6322
365	7:15:21	-44:05	4.73	4.87	Blend	5.36	B9V,B9.5V+
366	7:15:32	-49:24	6.35	6.39	HD 156330	8.54	B6
367	7:15:50	-39:45	⋯	7.56	Blend	8.24	B2II:ne,B8/B9IV
368	7:15:55	-45:35	4.42	4.94	HD 156385	6.92	WC
369	7:16:03	-37:58	6.01	6.02	HD 156468	7.77	B1Ve
370	7:16:11	-41:49	7.63	7.86	Blend	8.2P	B9IV,B8
371	7:16:30	-48:10	⋯	9.22	CD-48 11610	10.10	B2II/III
372	7:17:15	-45:21	⋯	6.77	HD 156623	7.26	A0V
373	7:17:17	-45:57	5.13	5.49	Blend	6.79	O,B2III
374	7:17:19	-37:59	5.11	5.57	Blend	7.08	B2III,O
375	7:17:26	-38:37	6.71	6.89	Blend	8.01	B5,B9III
376	7:17:37	-39:29	⋯	8.48	Blend	8.20	A5Ib-II,B5III
377	7:18:08	-39:59	7.40	7.57	HD 156834	9.48	B2/B3III
378	7:18:10	-47:59	⋯	7.94	CD-47 11463	8.00	A0/A1V
379	7:18:11	-40:18	⋯	8.21	Blend	7.81	B9V,A2V
380	7:18:11	-38:24	8.56	7.57	Blend	8.5P	B7IV/V,B5,B8
381	7:18:30	-42:07	⋯	7.50	Blend	7.4P	A5V,B9
382	7:18:34	-49:45	6.57	⋯	Blend	6.94	Ap,A5/A6III
383	7:19:17	-38:11	8.26	8.00	Blend	7.71	B9.5IV,B9IV
384	7:19:24	-43:53	6.93	6.32	CD-43 11640	9.40	B3III/IV
385	7:19:29	-47:25	2.26	3.12	HD 157042	5.25	B2IIIne
386	7:19:30	-42:02	⋯	8.18	HD 157061	7.50	A0IV
387	7:19:39	-44:44	⋯	8.69	HD 157063	8.50	Ap
388	7:19:42	-38:31	6.64	7.31	Blend	8.10	B9.5V,B3V:nne,B3IV/V
389	7:19:46	-42:47	6.70	7.31	HD 157099	8.83	B3Vne
390	7:19:58	-45:23	6.94	7.44	HD 157115	8.60	B5IV
391	7:20:00	-45:09	⋯	7.88	Blend	8.6P	B8III,B9
392	7:20:10	-37:03	⋯	7.29	Blend	7.6P	Seven B and A
393	7:20:39	-43:45	7.08	6.91	HD 157241	7.90	B4IV
394	7:20:41	-44:06	3.50	3.93	HD 157243	5.12	B7III
395	7:20:54	-40:52	⋯	7.93	Blend	8.8P	B9V,A2
396	7:20:58	-33:18	⋯	7.44	SAO 208774	7.90	B9.5V

TABLE 5—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	Spectral Type
397	7:21:10	-46:09	4.60	5.09	HD 157317	6.75	B7III
398	7:21:19	-36:43	...	7.39	SAO 208781	9.70	B4V
399	7:21:40	-47:32	6.67	4.98	Blend	8.5P	A0V,A0,B6/B7
400	7:21:41	-34:41	6.19	5.58	HD 157486	6.16	A0Vs
401	7:21:58	-43:34	...	7.85	Blend	8.9P	B3II/III,B3,WR
402	7:22:10	-41:56	5.88	6.27	HD 157519	7.84	B5IV
403	7:22:33	-42:30	...	8.23	HD 157572	8.60	B2IV
404	7:22:55	-44:35	5.14	5.62	Blend	7.58	B3III,B7II
405	7:23:07	-34:10	...	7.14	Blend	7.49	B9,B2III
406	7:23:09	-39:44	6.96	7.34	Blend	8.98	B3III/IV,B
407	7:23:11	-45:47	3.56	3.96	Blend	4.31	B7V+,?,?,A0V
408	7:23:14	-42:11	6.75	7.12	Blend	7.7P	B4III,B3II,B8,B8,A0
409	7:23:19	-47:05	4.10	4.33	HD 157698	7.13	B7III
410	7:23:19	-46:33	6.93	6.98	HD 157711	8.63	B9II/III
411	7:23:31	-40:08	...	7.62	Blend	8.05	B8II/III,B9III,B
412	7:23:51	-40:27	7.76	8.92	HD 157783	9.27	B3II/III
413	7:24:06	-41:16	6.03	6.55	HD 157846	8.15	B2/B3III
414	7:24:07	-46:59	3.83	4.26	HD 157832	6.65	B2ne
415	7:24:07	-47:18	...	6.56	Blend	7.61	A1V,A0V
416	7:24:41	-40:48	...	7.73	Blend	8.7P	B8V,A0,A0
417	7:24:45	-43:40	...	7.45	CD-43 11725	9.60	A0III
418	7:24:46	-38:44	6.07	6.55	Blend	7.84	B3Vn,B3III/IV
419	7:24:46	-36:53	5.00	...	HD 157957	7.78	B7III
420	7:24:52	-49:00	5.63	6.62	HD 157944	8.80	B5III
421	7:24:55	-44:36	7.82	7.51	Blend	8.3P	A3IIm,B3II/III,A2
422	7:25:13	-41:12	...	7.17	Blend	9.75	B8Ib/II,B9V
423	7:25:27	-43:56	4.70	4.99	HD 158042	6.19	B5III
424	7:25:37	-46:39	5.22	5.53	HD 158078	7.62	B4IV
425	7:25:48	-40:43	...	8.06	SAO 228017	8.17	Ap
426	7:25:52	-48:05	7.39	7.44	CD-48 11757	9.10	B6V
427	7:25:58	-40:18	...	8.04	Blend	7.9P	B9V,A0V,A3
428	7:25:58	-38:30	...	7.00	HD 158156	6.39	A2V
429	7:26:12	-45:40	...	8.08	HD 158144	9.42	B9Ib/II
430	7:26:13	-44:42	6.85	6.73	Blend	7.34	Ap,A1III/IV
431	7:26:15	-44:55	...	8.10	HD 158158	9.39	B9V
432	7:26:26	-46:06	...	8.22	Blend	8.59	B9V,Ap
433	7:26:27	-41:32	...	10.28	CD-41 11684	8.30	A0V
434	7:26:33	-42:18	6.06	6.53	Blend	7.6P	B8,A0V,B9,B8
435	7:26:51	-38:38	...	8.51	SAO 208882	8.70	B9.5V
436	7:27:07	-43:02	6.55	6.75	Blend	8.16	B5III,A0V
437	7:27:26	-37:16	-0.06	...	HD 158408	2.70	B2IV
438	7:27:28	-45:50	...	7.69	Blend	8.67	A1m,B8/B9II
439	7:28:01	-41:58	...	8.21	HD 158471	8.60	B8/B9IV
440	7:28:09	-38:39	6.24	6.59	Blend	7.64	B8/B9III,B8IV
441	7:28:10	-41:40	...	9.84	Blend	9.0P	B9IV/V,A5
442	7:28:12	-41:01	6.06	5.91	Blend	6.91	B7/B8IV:,A1V
443	7:28:34	-44:19	6.24	6.36	Blend	8.04	B3III,B8/B9V:+,B9IV,
444	7:28:34	-45:49	...	7.42	Blend	8.3P	B9V,A2,A0/A1V,B8V
445	7:28:43	-48:23	6.78	7.34	HD 158603	9.40	B5III
446	7:28:45	-47:33	7.14	7.58	Blend	8.74	B8III/IV,A0IV/V
447	7:29:10	-35:07	...	8.17	SAO 208939	8.90	B5II/III
448	7:29:12	-45:00	6.87	6.53	Blend	8.89	B5III,B9IV
449	7:29:24	-44:28	6.92	6.90	HD 158746	8.23	B9IV
450	7:29:25	-42:05	...	8.22	Blend	7.59	A1/A2m,A0V
451	7:29:33	-45:29	5.33	5.42	HD 158747	7.08	B9III
452	7:29:36	-41:09	5.20	5.15	HD 158799	5.84	B9Ib-II
453	7:29:55	-42:22	5.13	5.48	Blend	7.07	B3IV/V,B9III
454	7:30:12	-45:35	5.18	5.42	HD 158864	8.15	B2Ib/IIp
455	7:30:13	-44:02	5.89	6.08	Blend	7.77	B5V,B8/B9II,B9III/IV
456	7:30:16	-37:04	-0.73	...	HD 158926	1.60	B2IV+
457	7:30:18	-46:34	4.46	4.61	HD 158906	7.66	B2/B3II
458	7:30:29	-44:58	5.91	5.96	HD 158928	7.00	B9III
459	7:30:38	-35:50	...	6.45	...	...	...
460	7:30:44	-41:01	...	6.46	Blend	7.38	A2III,B9III/IV
461	7:30:52	-40:31	5.87	6.35	HD 159035	7.13	B8IV
462	7:30:54	-43:07	6.49	6.31	Blend	8.2P	B5II/III,?,B9
463	7:30:58	-47:52	6.04	6.35	HD 159041	8.00	B9Ib/II
464	7:30:59	-35:42	6.17	...	SAO 208967	7.60	B7III
465	7:31:08	-41:18	5.09	5.32	HD 159110	7.57	B4Ib
466	7:31:11	-48:39	6.33	...	HD 159042	8.80	B5III
467	7:31:11	-46:58	6.96	7.09	Blend	8.81	B8II,B9IV
468	7:31:17	-42:54	5.69	5.86	Blend	7.60	B6IV,B5II/III
469	7:31:18	-44:12	6.23	6.35	HD 159112	8.60	B3III
470	7:31:32	-34:49	6.74	...	SAO 208978	8.00	B6/B7III
471	7:31:38	-44:02	...	6.50	CD-43 11842	9.00	B8II
472	7:31:51	-38:50	...	6.75	Blend	8.14	A0V,B8IV/V
473	7:31:52	-46:29	4.26	4.08	HD 159217	4.60	A0V
474	7:32:49	-39:38	7.23	7.08	SAO 209012	9.40	B4III:
475	7:32:54	-42:58	7.14	...	Blend	8.0P	B9Ib/II,B9
476	7:32:58	-44:32	5.80	6.25	HD 159402	8.11	B3III/IV
477	7:33:30	-45:08	5.85	6.01	HD 159489	8.25	B3IV
478	7:33:39	-40:37	...	7.22	Blend	8.1P	B8/B9Ib,B5,B9V,A0,A0
479	7:33:44	-38:47	8.95	7.62	HD 159573	8.44	B3III
480	7:33:46	-46:05	6.51	6.71	HD 159554	8.53	B7II
481	7:33:47	-40:19	6.96	6.92	HD 159574	7.70	B9Ib
482	7:33:48	-42:57	...	4.56	HD 159532	1.90	F1II
483	7:33:53	-35:53	...	6.85	CPD-35 7060	10.50	A1/A2IV
484	7:34:31	-42:51	4.67	4.47	HD 159707	6.10	B8V
485	7:34:54	-44:22	7.73	7.68	HD 159767	9.40	B7Ib
486	7:35:01	-46:17	...	9.16	HD 159792	9.44	B2II
487	7:35:03	-37:53	6.59	...	HD 159848	9.34	B3V:nne
488	7:35:52	-43:50	5.79	6.19	HD 159958	7.77	B8II
489	7:36:00	-45:55	5.98	6.41	HD 159959	8.18	B5III
490	7:36:13	-42:04	...	8.51	CD-41 11881	8.80	B9III
491	7:36:16	-40:17	6.43	7.19	HD 160069	7.90	B7/B8II
492	7:36:59	-44:22	...	8.29	HD 160192	9.00	A0V
493	7:37:02	-44:58	5.92	6.00	Blend	7.79	B7/B8Ib,B6III
494	7:37:03	-47:23	7.05	...	HD 160152	9.30	B5II
495	7:37:03	-41:20	7.61	7.78	CD-41 11898	9.20	B8Ib
496	7:37:17	-37:44	...	9.73	HD 160337	7.99	B1/B2Ia.
497	7:37:24	-41:07	...	8.19	CD-41 11903	8.90	B9II/III
498	7:37:25	-46:55	5.45	5.13	HD 160263	5.79	A0V
499	7:37:34	-41:41	5.56	5.76	Blend	7.6P	B8,B9,A0,A2,A0
500	7:37:35	-42:27	...	8.49	CD-42 12374	9.00	B9Ib
501	7:37:55	-45:52	...	7.80	CD-45 11795	11.00	A0
502	7:38:10	-44:47	...	7.53	HD 160414	7.70	A3V
503	7:38:30	-46:18	...	7.12	Blend	7.31	A0/A1V,A0IV/V
504	7:38:30	-41:51	6.35	6.42	HD 160494	8.6	B2II
505	7:38:32	-43:40	...	7.73	HD 160464	8.90	B7/B8II/
506	7:38:48	-41:17	8.77	...	CD-41 11933	10.20	B7/B8Ib/
507	7:39:02	-39:01	-0.05	0.84	HD 160578	2.40	B1.5III
508	7:39:20	-42:02	6.95	6.66	Blend	7.7P	B9Ib/II,B8
509	7:39:24	-41:00	7.18	7.40	Blend	7.4P	A1IV,B6II,A0
510	7:39:32	-46:36	5.50	5.68	Blend	7.48	B6III,B8II
511	7:39:50	-45:58	5.54	5.31	HD 160715	6.93	B9IV/V
512	7:39:54	-42:27	7.66	7.37	CD-42 12415	9.70	F5IV:
513	7:39:59	-38:19	...	5.92	CPD-38 7001	9.3	K1/K2III
514	7:40:06	-42:13	7.17	7.04	Blend	8.1P	B7II,A0,A0
515	7:40:16	-38:08	5.53	...	HD 160812	8.06	B3IV
516	7:40:17	-44:37	5.97	6.16	Blend	7.87	B5III,A0IV,B8/B9Ib
517	7:40:33	-41:39	6.66	6.63	HD 160876	7.86	B7III
518	7:40:38	-44:01	6.20	6.09	HD 160856	9.90	B6III
519	7:40:45	-40:18	6.64	6.92	CD-40 11787	8.60	B2/B3
520	7:40:49	-44:11	5.84	5.94	HD 160878	8.67	B2III/IV
521	7:40:55	-43:04	...	7.61	CD-42 12427	9.60	B8Ib
522	7:40:55	-46:03	5.49	5.32	HD 160917	6.72	B9V
523	7:41:03	-42:44	...	6.48	HD 160928	5.87	A1V+
524	7:41:04	-39:51	...	6.21	SAO 209210	8.80	B4II:
525	7:41:10	-42:31	6.96	6.65	HD 160960	8.50	B8II
526	7:41:30	-45:38	5.86	5.68	HD 160993	7.74	B1Iab
527	7:41:49	-41:14	6.73	7.11	Blend	8.4P	B3II,A3:V:,A0
528	7:41:54	-40:47	6.40	6.57	Blend	8.04	B8II,B2II/III,B8/B9I

TABLE 5—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	Spectral Type
529	7:42:50	-39:24	...	5.59	HD 161277	7.08	B9
530	7:43:03	-40:40	...	7.40	HD 161310	8.30	A1V
531	7:43:14	-43:29	5.43	5.64	HD 161312	7.64	B6II/III
532	7:43:16	-42:29	7.95	7.59	CD-42 12464	9.00	B9II
533	7:43:30	-40:58	...	5.55	HD 324325	10.P	A0
534	7:43:32	-40:49	5.35	...	Blend	7.56	B8II,B3III
535	7:43:38	-42:02	7.24	7.51	Blend	8.3P	B9V,A0
536	7:44:15	-41:04	...	5.74	CD-41 12036	9.9	A9V
537	7:44:18	-40:55	5.66	...	HD 161531	9.06	B2/B3Ib
538	7:44:26	-42:12	7.63	...	HD 324369	9.99	B2
539	7:44:32	-42:32	7.51	7.21	CD-42 12487	8.90	B9III
540	7:44:59	-42:56	7.40	...	Blend	8.4P	B8/B9Ib,A2
541	7:45:58	-42:25	7.43	...	Blend	8.9P	B4II/III,A2

[a] Object 32. This object coincides with the G5V star HD 147513 with $V = 5.40$ and the white dwarf CD-38 10980 with $V = 10.98$. McCook & Sion 1987 give a spectral type of DA2, corresponding to an effective temperature of about 25,000 for the white dwarf. We have tabulated the white dwarf's V magnitude since it should dominant the ultraviolet flux.

[b] Object 316. Although the A1 V star HD 155237 is six magnitudes fainter in V than the F3 III–IV star HD 155203, the contributions of the two in the ultraviolet may be comparable due to the temperature difference (ignoring interstellar extinction).

NOTE.—Table 5 also appears in machine-readable form in the AAS CD-ROM Series, Vol. 4.

Figure 7 shows plots of the color excesses $E_{17,V} = (m_{1781} - V) - (m_{1781} - V)_0$ and $E_{13,V} = (m_{1375} - V) - (m_{1375} - V)_0$ against the apparent distance modulus, $\mu_V = V - M_V$. Only stars with spectral classes of O, B, A0 and A1 and with luminosity classes were included (for a total of 566 different stars plotted in Fig. 7*a*, 7*b*, or both). The absolute magnitudes, M_V, were obtained from the spectral types and luminosity classes using the tables given by Lang (1992). Lang's tables of effective temperature and gravity as a function of spectral type and luminosity class were used together with Tables 1 and 2 to obtain the intrinsic colors, $(m_{1781} - V)_0$ and $(m_{1375} - V)_0$.

The wavelength dependence of ultraviolet extinction varies considerably from one line of sight to another. Mathis (1990) has tabulated the extinction law for cases with $R = A_V/E_{B-V} = 3.1$ and 5.0. The mean visual extinction was estimated by Sharov (1964) to range from $\rho_V \sim 0.6$ mag kpc^{-1} to $\rho_V \sim 3.5$ mag kpc^{-1} over our fields. In Figure 7 we have plotted the run of color excess with apparent distance modulus for four combinations of R and ρ_V. We will regard these as covering the extremes we might encounter here.

The increasing scatter at larger apparent distance modulus indicates that the mean reddening does indeed range as widely as Sharov's study suggested. However, it appears that variations in the reddening law are also required to fully account for the distribution. Since many of the early-type stars in these fields suffer high extinction, variations in the ultraviolet extinction curve could also contribute to scatter in the measured ultraviolet magnitudes as a function of spectral type, V or $E(B - V)$. The detailed implications of the ultraviolet photometry for interstellar extinction will be discussed after we have extracted the photometry for other fields in the far-ultraviolet survey.

While a majority of points fall between the extreme absorption lines in Figure 7, there are many which do not. The stars below the lower curve probably suffer extinction which is higher than the average. On the other hand, stars above the upper curve are more numerous and can not be explained as easily.

An examination of Figure 7 shows that raising the upper curves (0.6, 5.0) by about 0.5 magnitudes would encompass the nearest and presumably least reddened of the stars. Such an adjustment could be accomplished, for example, by altering the adopted effective temperatures by an amount corresponding to one or one and a half spectral subclasses. Such an uncertainty in the temperature scale or in the calculated colors is plausable. Alternatively, if we adopted the ultraviolet magnitude scale suggested by the comparison with the S201 data (discussed in § 4, above), the points of individual stars in Figure 7 would move down by 0.5 magnitudes. While this, too, would alleviate the discrepancy, we prefer the present calibration until the pre- and post-flight calibrations have been analyzed.

Based on the discussion of errors at the end of § 4, we estimate that the uncertainty in the color excesses is about 0.50 magnitudes at a 1.4 sigma level. The dashed lines in Figure 7 show the position of the (0.6, 5.0) curve adjusted upward by one magnitude to include both uncertainties. The stars above the dashed curves are likely to have ultraviolet excesses. However, to be conservative, we have only included stars with measurements of both ultraviolet magnitudes and for which both measurements place the star above the dashed line in our final list of stars with ultraviolet excesses. The 25 objects meeting these criteria (which constitute 7% of the 341 stars in Figure 7 which have both magnitudes) are indicated by open circles and are listed in Table 6. It should be kept in mind that many of the objects which failed to meet our requirement for excesses in both colors may nonetheless actually have an excess. Additionally, many of the objects not included in Figure 7 (for example stars deemed to be blends) would no doubt exhibit an excess if examined carefully. Thus, the stars in Table 6 represent a very conservative lower limit to the true incidence of ultraviolet excesses.

In Papers I and II a small number of stars were found with apparent ultraviolet excesses. We suggested that these objects were nearby hot white dwarfs. The availability of MK spectral types for the current sample changes this picture considerably. The spectral types in Table 6 range from B1 to A2 (our arbitrary cutoff) and the luminosity classes range from V to Ib. Clearly these are not nearby white dwarfs.

There are several ways to explain the stars with ultraviolet excesses. One possibility is that the ultraviolet magnitudes of these stars (which represent slightly less than 5% of the objects in Fig. 7) are incorrect. However, m_{1781} and m_{1375} were obtained with two different cameras; any errors due to camera or emulsion artifacts should be uncorrelated between them. Thus, our requirement that the excess be evident in both magnitudes at a statistically significant level should eliminate any stars with erroneously bright ultraviolet magnitudes.

Given the spatial resolution of our images, we must consider the possibility that the excess ultraviolet emission arises from the chance superposition of another object on the star identified as the ultraviolet object. For example, a foreground hot white dwarf could easily explain the ultraviolet brightness. To

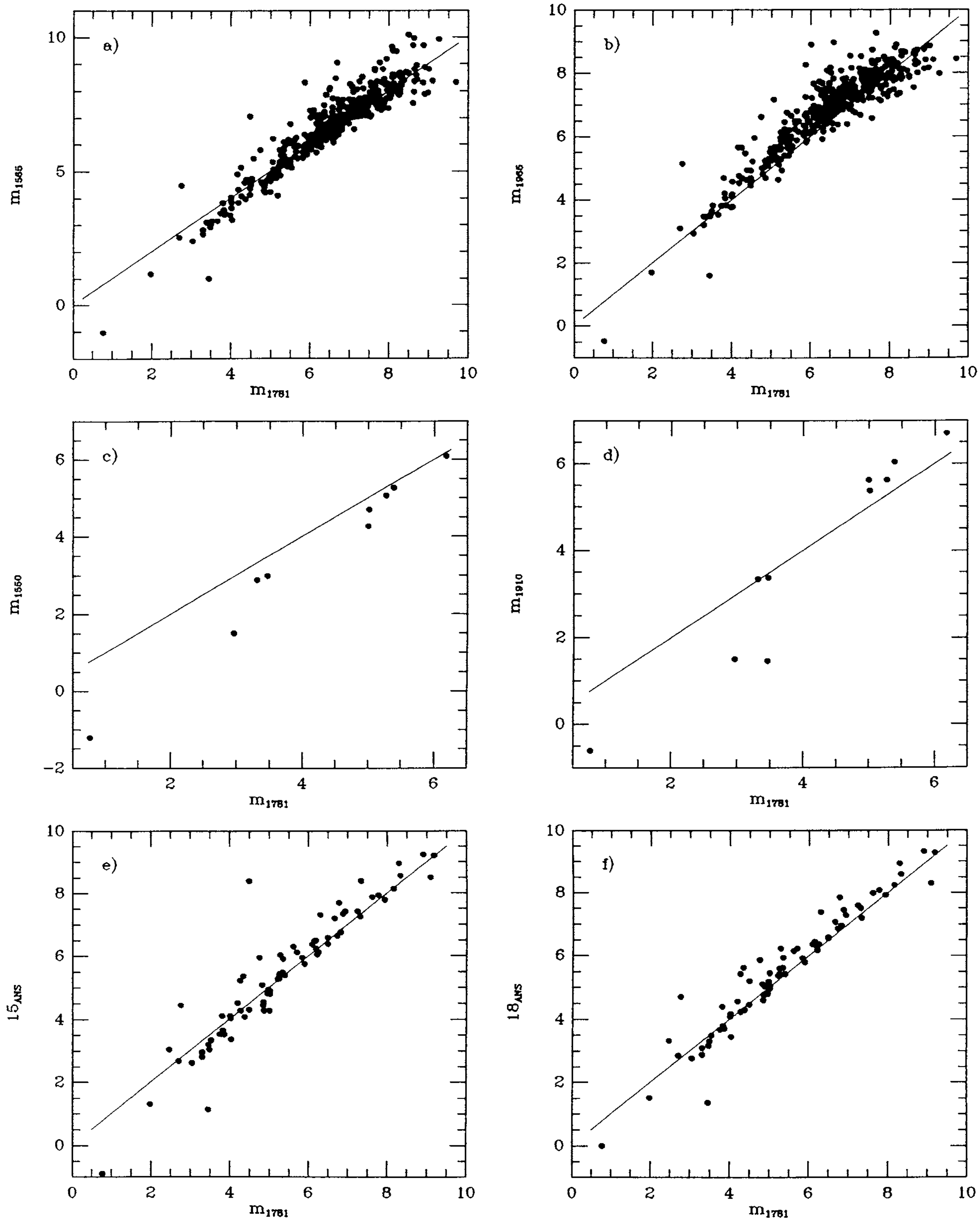

FIG. 3.—Comparisons of m_{1781} with data from the *TD-1* (*a* and *b*), *OAO 2* (*c* and *d*) and *ANS* (*e* and *f*) satellites

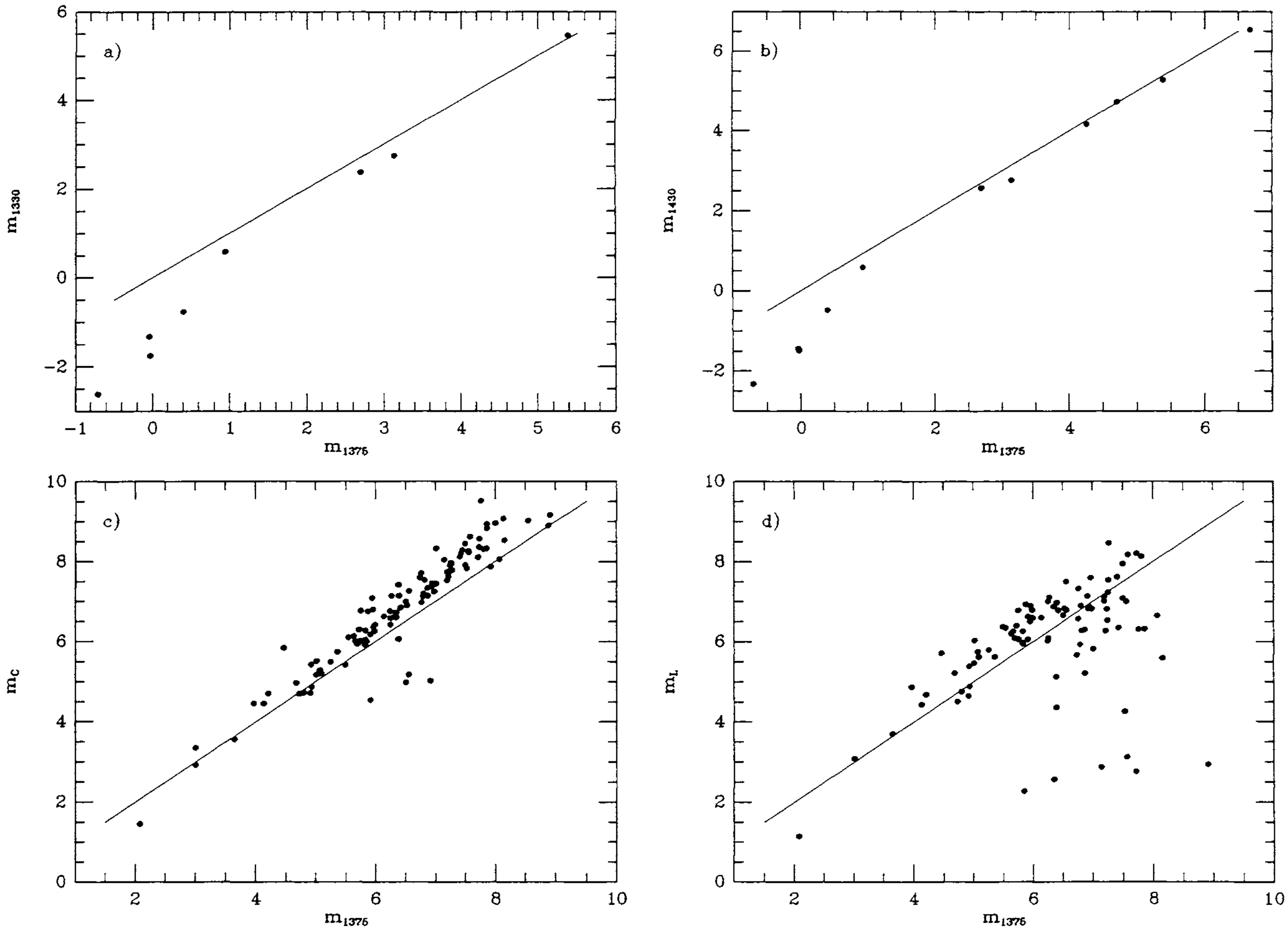

FIG. 4.—Comparison of m_{1375} with *OAO 2* and S201 magnitudes

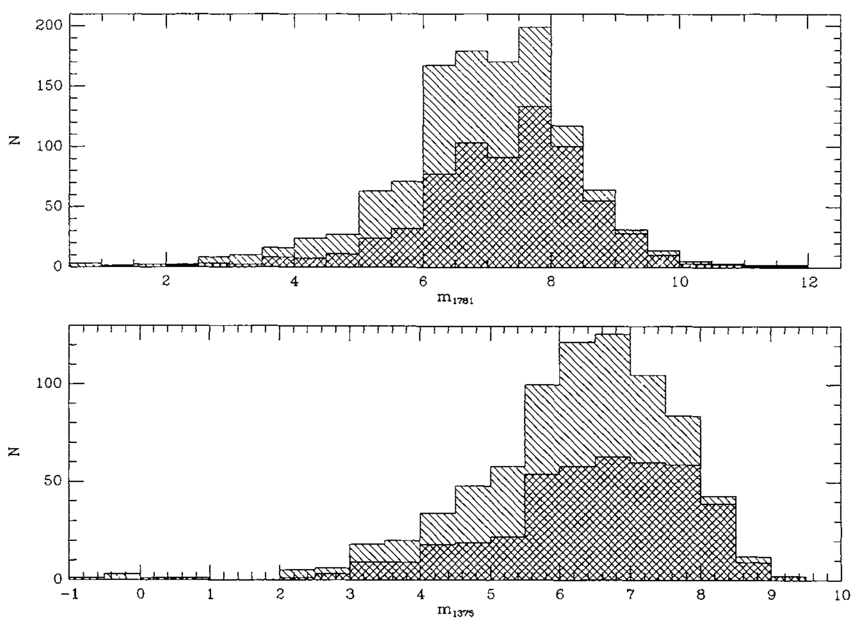

FIG. 5.—Frequency distribution of stars with m_{1781} (*a*) and m_{1375} (*b*). The more darkly shadded regions represent the M8 sample while the lightly shaded region represents the ζ Sco stars.

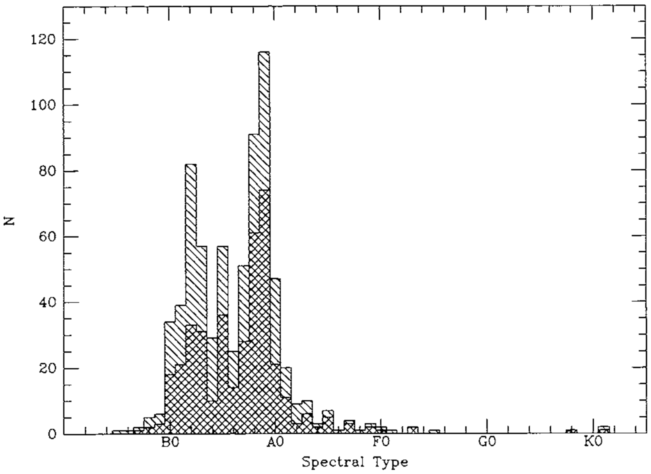

FIG. 6.—Frequency distribution of stars in the selected sample with spectral type. The more darkly shaded portion of the histogram represents the M8 sample while the lightly shaded region represents the ζ Sco stars.

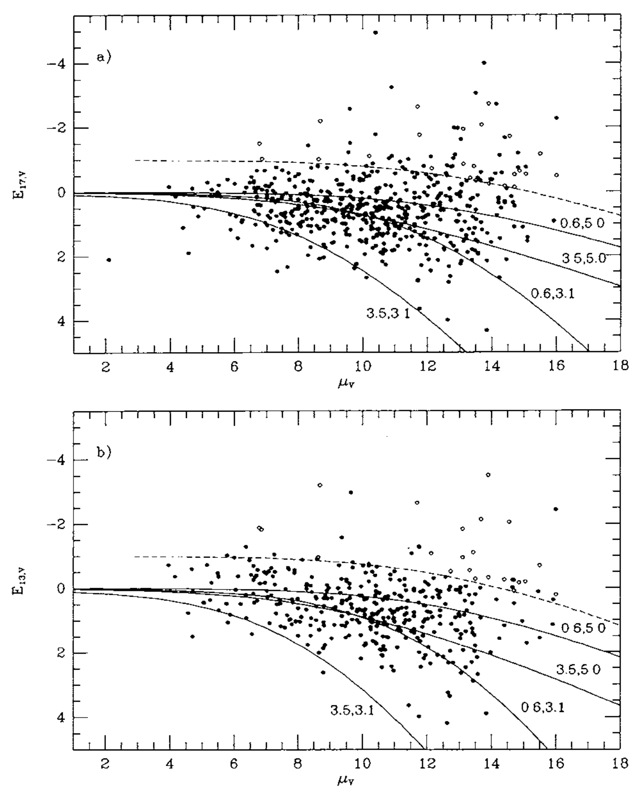

FIG. 7.—Plots of the color excesses in $(m_{1781} - V)$, denoted by $E_{17,V}$, and $(m_{1375} - V)$, denoted by $E_{13,V}$, against apparent visual distance modulus, $\mu_V = V - M_V$, for stars with MK spectral types of O, B, A0, and A1 and known luminosity class. Open circles denote stars with significant ultraviolet excesses as discussed in the text. The solid curves show the expected variation of color excess with apparent distance modulus under various assumptions. Each is labeled with the V absorption per kiloparsec, ρv (either 0.6 or 3.5) and the ratio of total to selective absorption, $R = A_V/E_{B-V}$ (either 3.1 or 5) for the assumed absorption law. The dashed lines are the curves for $R = 5$ and $\rho v = 0.6$ mag kpc^{-1} shifted upward by 1 magnitude as explained in the text.

TABLE 6

STARS WHICH EXHIBIT ULTRAVIOLET EXCESSES

No.	Identification	Sp. Type	μ_V	$E_{17,V}$	$E_{13,V}$	$E_{13,17}$
ζ 251	HD 153767	A0V	6.8	-1.5	-1.9	-0.4
ζ 287	HD 154410	A0V	6.8	-1.0	-1.8	-0.8
ζ 409	HD 157698	B7III	8.6	-1.0	-1.0	0.0
M 200	HD 164295	B9.5V	8.7	-2.2	-3.2	-1.0
M 155	SAO 186016	B9III	10.2	-1.1	-0.7	0.4
ζ 221	CPD-29 4400	B9.5 III	11.7	-2.6	-2.6	-0.0
ζ 518	HD 160856	B6III	11.8	-1.8	-1.3	0.5
ζ 463	HD 159041	B9Ib/II	12.1	-0.7	-1.1	-0.4
ζ 239	SAO 208310	B4II/III	12.7	-0.8	-0.5	0.2
M 178	HD 164030	B5III	13.1	-1.9	-1.8	0.1
M 443	SAO 186514	B7II	13.1	-0.8	-1.0	-0.1
M 357	HD 166192	B2II	13.3	-0.4	-0.6	-0.1
M 272	HD 165132	B5/B6Ib	13.4	-0.8	-1.1	-0.3
M 463	HD 167333	B4III	13.5	-0.3	-0.3	0.0
M 194	CPD-31 5209	B8/B9II	13.7	-2.1	-2.1	-0.1
M 707	HD 171858	B7/B8II	13.9	-2.7	-3.5	-0.8
M 317	HD 165765	B2III	13.9	-0.2	-0.3	-0.1
ζ 495	CD-41 11898	B8Ib	14.4	-0.2	-0.2	-0.1
M 505	CPD-29 5474	B8Ib/II	14.6	-1.7	-2.1	-0.4
M 408	CPD-31 5415	B7Ib/II	14.7	-0.5	-0.2	0.3
ζ 485	HD 159767	B7Ib	14.7	-0.1	0.1	0.2
ζ 275	CD-42 11823	B7/B8Ib	14.8	-0.6	-0.2	0.5
M 379	CPD-31 5395	B4II	15.1	-0.5	-0.2	0.3
M 354	CPD-32 5172	B5Ib/II	15.5	-1.1	-0.7	0.5
M 159	CPD-30 5098	B2/B3Ib	16.0	-0.5	0.2	0.7

assess this idea we interrogated the SIMBAD data base for objects within 10′ of 225 locations scattered across our fields. A 10′ radius for identifying superposed objects is rather conservative; stars separated by that much on the sky would most likely be recognized as two objects in our extraction of stellar magnitudes. Fifty percent of the random locations yielded one or more objects which would be deemed plausible sources of far-ultraviolet radiation (i.e., earlier than A2 in spectral type). Thus, if the 25 objects in Table 6 were due to chance superpositions, there should be an approximately equal number of other ultraviolet objects superposed on locations without a plausible ultraviolet source from SIMBAD. Tables 4 and 5 contain only eight objects with no associated SIMBAD object and another nine where the identified object was too late in spectral type to be the source of the ultraviolet radiation. While this total of 17 objects is not significantly fewer than the objects listed in Table 6, as noted above, the number of stars in the table represents a lower limit to the incidence of ultraviolet excesses. Thus, we conclude that the source of the excess ultraviolet in many or most of the objects in Table 6 is physically related to the identified stars.

Is it possible that the ultraviolet radiation comes from a companion to the visible star? For this to be the case the companion would have to be fainter than the primary star in the visible but enough hotter to dominate the ultraviolet spectrum. For most of the stars in Table 6 a suitable companion can not be found among normal stars. Even very hot white dwarfs are simply too faint in the ultraviolet to outshine B or early A dwarfs. The only possibility which seems marginally feasible is to combine one of the later giants in the table with a hotter main sequence star. However, this could only explain a very few of the stars in Table 6.

The stars in Table 6 should be further investigated to determine the source of the ultraviolet excesses. Investigation of the objects with no optical identification and those identified with late stars would also be worthwhile. It is likely that some interesting objects will be found in that way.

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REFERENCES

Carruthers, G. R. 1986, Proc. SPIE, 687, 11
Carruthers, G. R., Dohne, B. C., Shephard, K. K., Christensen, S. A., & Schmidt, E. G. 1994, in preparation
Carruthers, G. R., Morrill, J. S., Dohne, B. C., & Christensen, S. A. 1992, Proc. SPIE, 1764, 21
Carruthers, G. R., & Page, T. 1983, ApJS, 53, 623
———. 1984a, ApJS, 54, 271
———. 1984b, ApJS, 55, 101
———. 1984c, PASP, 96, 447
Christensen, S. A., Carruthers, G. R., & Dohne, B. C. 1994, in preparation
Code, A. D., Holm, A. V., & Bottemiller, R. L. 1980, ApJS, 43, 501
Houk, N. 1978, The Michigan Catalogue of the Two-Dimensional Spectral Types for the HD Stars, Vol. 2 (Ann Arbor: Univ. Michigan)
———. 1982, The Michigan Catalogue of the Two-Dimensional Spectral Types for the HD Stars, Vol. 3 (Ann Arbor: Univ. Michigan)
Houk, N., & Smith-Moore, M. 1988, The Michigan Catalogue of the Two-Dimensional Spectral Types for the HD Stars, Vol. 4 (Ann Arbor: Univ. Michigan).
Kurucz, R. L. 1993, in Improvements in Light Curve Modeling of Eclipsing Binary Stars, ed. E. F. Milone (Berlin: Springer), 93
Lang, K. R. 1992, Astrophysical Data: Planets and Stars (New York: Springer)
Mathis, J. 1990 ARA&A, 28,37
Page, T., Carruthers, G. R., & Heckathorn, H. M. 1982, Revised S201 Catalogue of Far-Ultraviolet Objects, NRL Report 8487 (Washington: Naval Research Laboratory)
Schmidt, E. G., & Carruthers, G. R. 1993a, ApJ, 408,484, (Paper I)
———. 1993b, ApJS, 89,259, (Paper II)
Sharov, A. S. 1964, Soviet Astron., 7, 689
Stetson, P. B. 1987, PASP, 99, 191
Thompson, G. I., Nandy, K., Jumar, C. Monfils, A., Houriaux, L., Carnochon, A., & Wilson, R. 1978, Catalogue of Stellar Ultraviolet Fluxes (London: Science Research Council)
Wesseluis, P. R., van Duinen, R. J., de Jong, A. R. W., Aalders, J. W. G., Luinge, W., & Wildeman, K. J. 1982, A&AS49, 427

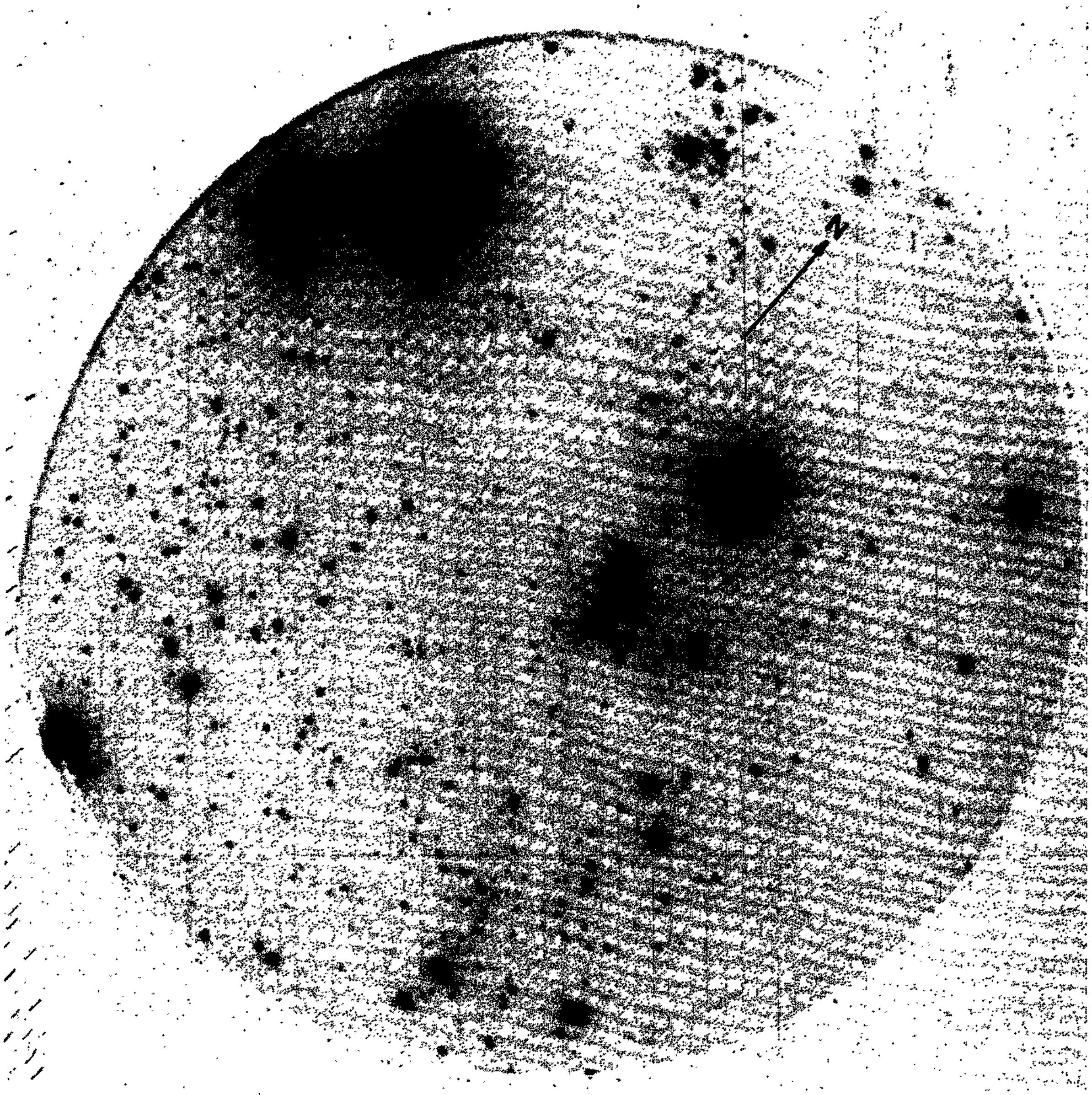

FIG. 2*a*

FIG. 2.—Prints of far-UV images of the two fields: (*a*) ζ Scorpii field, Camera 1 (λ_{eff} = 1375 Å), 100 second exposure; (*b*) ζ Scorpii field, Camera 2 (λ_{eff} = 1781 Å), 30 second exposure; (*c*) Messier 8 field, Camera 1, 100 second exposure; (*d*) Messier 8 field, Camera 2, 100 second exposure.

SCHMIDT & CARRUTHERS (see 96, 605)

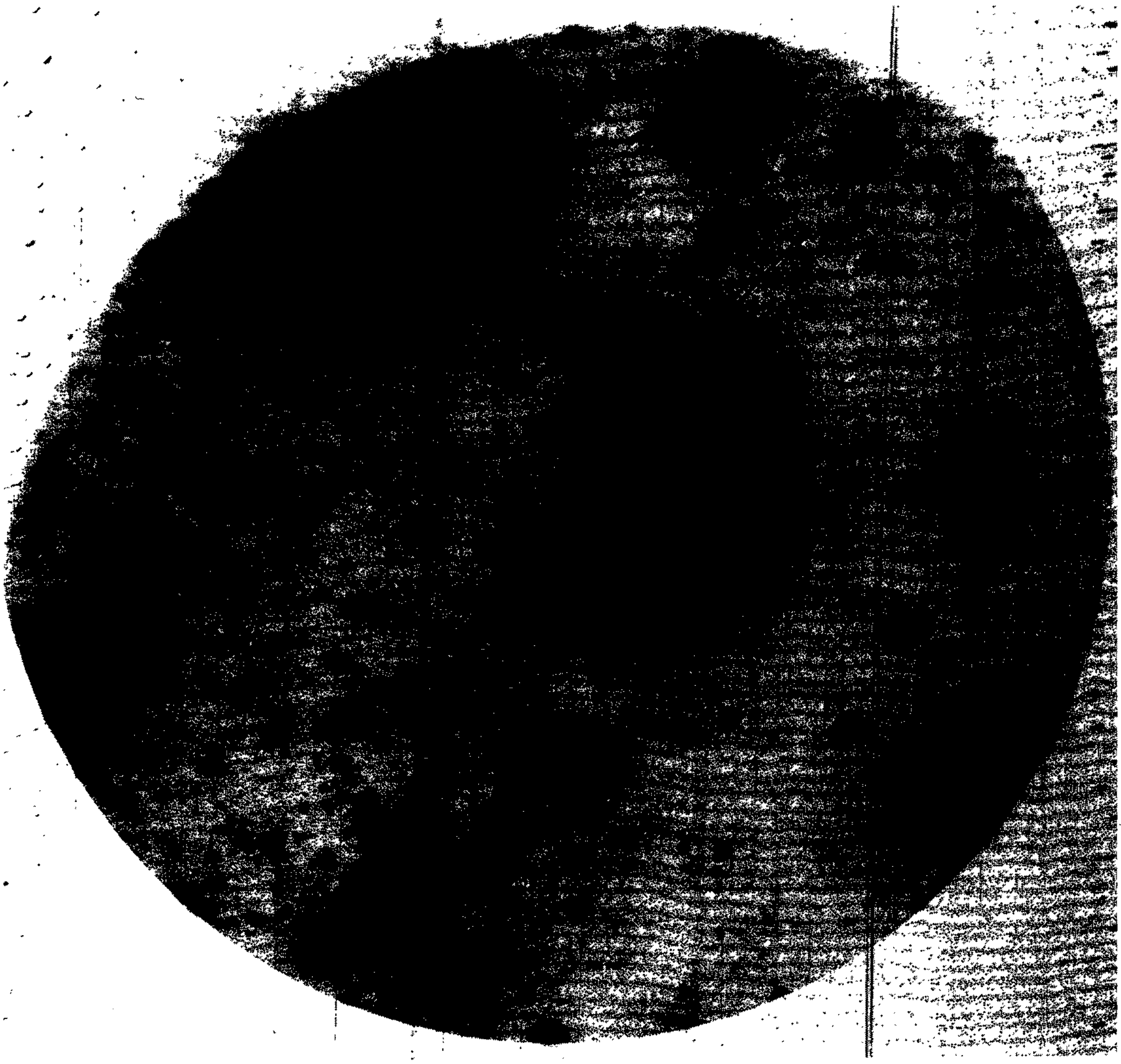

FIG. 2*b*

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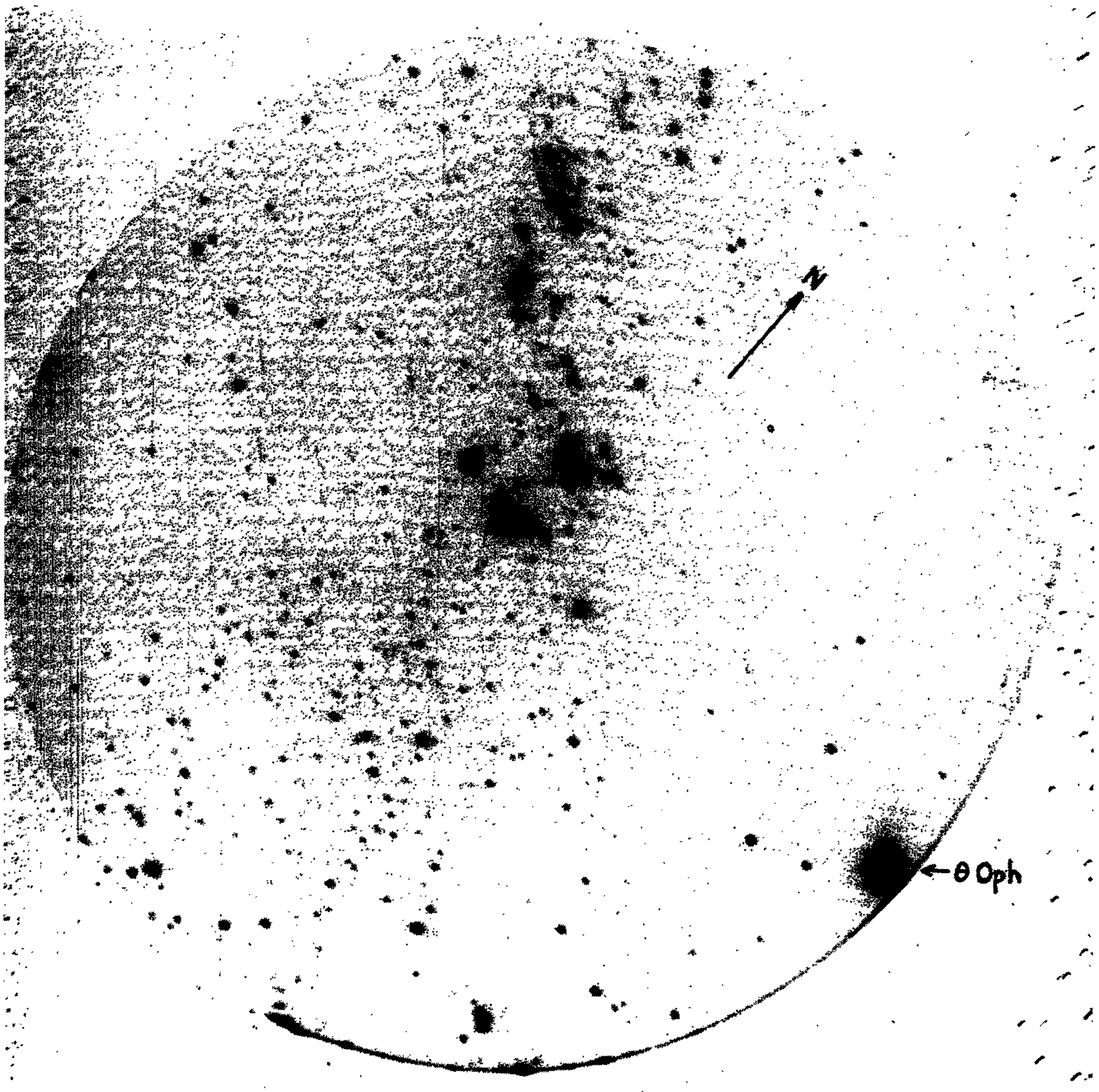

FIG. 2c

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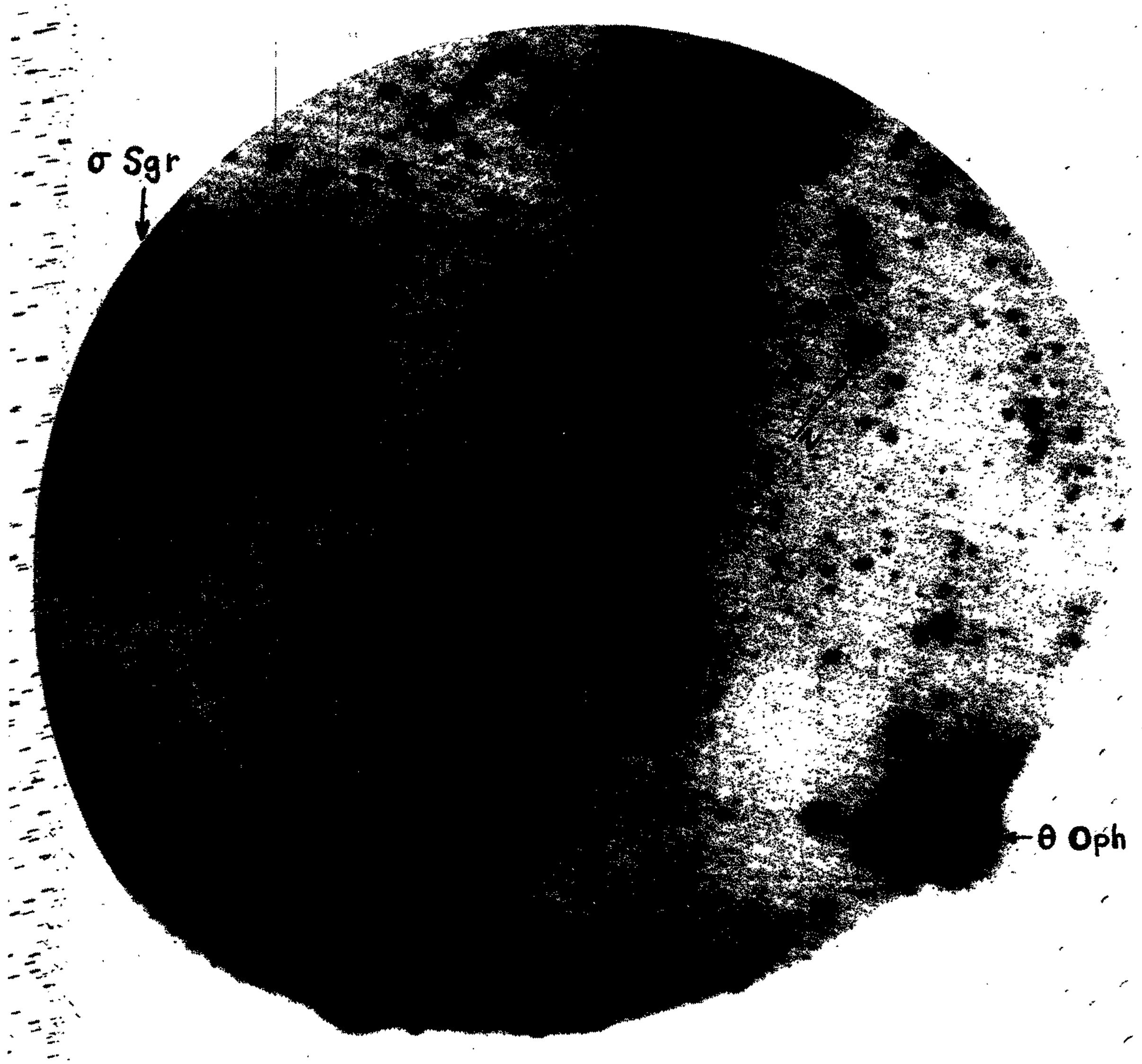

FIG. 2*d*

SCHMIDT & CARRUTHERS (see 96, 605)